EXHIBIT 2

CONFIDENTIAL

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

In re AMERICAN REALTY CAPITAL PROPERTIES, INC. LITIGATION	Civil Action No. 1:15-mc-00040-AKH

REBUTTAL EXPERT REPORT OF WALTER N. TOROUS, PH.D.

June 3, 2019

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I. INTRODUCTION

A. Qualifications

1. I, Walter Torous, am a Senior Lecturer at the Massachusetts Institute of Technology with a joint position at the Sloan School of Management and the Center for Real Estate. I am also a Professor Emeritus and the former Lee and Seymour Graff Endowed Professor at the John E. Anderson School of Management at the University of California at Los Angeles. I am a member of the American Finance Association and the Western Finance Association. I received my Ph.D. degree in Economics from the University of Pennsylvania in 1981. I have taught courses in managerial finance at the master's level and empirical methods in finance at the doctoral level.

2. My areas of research include fixed income securities and derivative instruments, the pricing of securities (including stocks, risky debt, options, futures, and mortgages), the reorganization of financially distressed firms, the behavior of interest rates, and statistical issues in finance. I have published peer-reviewed articles on event studies,[1] as well as market efficiency,[2] the pricing of stocks and bonds, the modeling of interest rate movements, and the valuation of a variety of financial instruments including options, futures, corporate debt, and mortgage-related securities. I have spoken at numerous academic and business conferences about my research. I am currently, or have been, the editor or associate editor of a number of finance journals, including the *Pacific-Basin Finance Journal*, *Economic Notes*, and *the Journal of Real Estate Finance and*

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[1] *See, e.g.*, Clifford A. Ball and Walter N. Torous, "Investigating Security Price Performance in the Presence of Event-Date Uncertainty," *Journal of Financial Economics* 22, 1988, pp. 123-153.

[2] *See, e.g.*, Harrison Hong, Walter Torous, and Rossen Valkanov, "Do Industries Lead Stock Markets?", *Journal of Financial Economics*, 83:2, 2007, pp. 367-396.

Economics. I am currently, or have been, an *ad hoc* referee for several finance journals, including the *Journal of Finance, Journal of Financial and Quantitative Analysis, Review of Financial Studies, Journal of Financial Economics*, and the *Journal of Empirical Finance.*

3. My complete curriculum vitae, which includes a list of my publications, is attached as **Appendix A** to this report. **Appendix B** lists my testimony in the past four years.

B. Assignment

4. I have been retained by Milbank LLP, counsel for American Realty Capital Properties, Inc., now known as VEREIT, Inc., and ARC Properties Operating Partnership L.P., now known as VEREIT Operating Partnership, L.P. (collectively "ARCP"); Paul, Weiss, Rifkind, Wharton & Garrison LLP ("Paul Weiss"), counsel to Nicholas S. Schorsch; and Kellogg, Hansen, Todd, Figel & Frederick P.L.L.C. ("Kellogg"), counsel to AR Capital, LLC, ARC Properties Advisors, LLC, Scott J. Bowman, Peter M. Budko, Brian D. Jones, William M. Kahane, and Edward M. Weil, Jr. to respond to the expert report of Professor Steven Feinstein served on ARCP on March 15, 2017 ("Feinstein Report")[3] and to the expert report of Zachary Nye served on ARCP on March 15, 2019.[4] Specifically, I have been asked to evaluate:

- Dr. Feinstein's opinion that ARCP's common stock, preferred stock, and debt securities (collectively the "ARCP Securities") traded in efficient markets during

[3] *See* Report on Market Efficiency of Professor Steven P. Feinstein, Ph.D., CFA, *In re American Realty Capital Properties, Inc. Litigation*, Civil Action No. 1:15-mc-00040-AKH, March 15, 2017 ("Feinstein Report").

[4] *See* Expert Report of Zachary Nye, Ph.D., *Jet Capital Master Fund, L.P. et al. v. American Realty Capital Properties, Inc. et al.*, No. 1:15-cv-00307-AKH, March 15, 2019 ("Nye Report").

the period from February 28, 2013 through October 29, 2014 (the "Relevant Class Period").[5]

- Dr. Nye's opinion that ARCP's common stock traded in an efficient market during the period from February 27, 2014 through October 28, 2014 (the "Relevant Jet Capital Period").[6]

5. In performing my research and analyses, I have relied upon the documents and data listed in **Appendix C** and/or cited in this report and exhibits. My work on this matter is ongoing, and I may review additional materials, including the opinions of other experts offered in this case, or conduct further analysis. I reserve the right to update, refine, or revise my opinions.

6. My hourly rate for time I spend on this matter is $875 per hour. In addition, I receive compensation based on the professional fees of Analysis Group, Inc., a financial and economic consulting firm, which has provided research support under my direction and supervision. My compensation and Analysis Group Inc.'s fees do not depend upon the opinions I form nor upon the outcome of this litigation.

II. SUMMARY OF OPINIONS

7. In my opinion, neither Dr. Feinstein nor Dr. Nye (together, "Plaintiffs' experts") provide reliable evidence that the ARCP Securities traded in efficient markets at all times during the relevant periods. Below is a summary of my opinions in reaching this conclusion.

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[5] *See* Feinstein Report, ¶1. In the Feinstein Report, Dr. Feinstein evaluated the efficiency of the markets for the ARCP Securities for the period from May 9, 2012 through October 29, 2014 (the "Original Class Period"). I understand from counsel that, since Dr. Feinstein served his report on March 15, 2017, the starting date for evaluating the efficiency of the markets for the ARCP Securities has changed from May 9, 2012 to February 28, 2013 (*i.e.*, the Relevant Class Period). I also understand from counsel that Dr. Feinstein has not served another market efficiency report in this matter to update any of his analyses for this change in the relevant period. For purposes of my report, unless I specifically reference the Original Class Period, I have limited my analyses and opinions to the Relevant Class Period.

[6] *See* Nye Report, ¶3.

- *The indirect Cammer and Krogman factors are not sufficient to establish market efficiency.* Academic literature demonstrates the inadequacy of these indirect indicators of market efficiency. The literature includes many real-world examples of securities that, although satisfying these supposed factors, traded in inefficient markets (**Section IV.**).

- *The fifth Cammer factor is the most important factor.* This factor is the only one that provides direct evidence of whether a security trades in an efficient market. Therefore, my report primarily focuses on evaluating Plaintiffs' experts' evaluations of the fifth *Cammer* factor (**Section IV.**).

- *Plaintiffs' experts' event studies fail to demonstrate a cause-and-effect relationship between new, material information and the prices of the ARCP common stock during the relevant periods* (**Section V.**). Specifically:

    - Dr. Feinstein's analysis of ARCP's common stock price reaction on October 29, 2014 does not reliably establish a cause-and-effect relationship between news and ARCP's common stock price during the Relevant Class Period. Dr. Feinstein tested the price reaction to the alleged corrective disclosure on the last day of the Relevant Class Period, when ARCP's common stock price declined approximately 19 percent. In doing so, Dr. Feinstein introduced bias by selecting a date that was *ex ante* obviously associated with a highly significant movement in the common stock price. Additionally, ARCP's common stock price reaction on October 29, 2014 provides no information about whether ARCP's common stock price quickly impounded new and material information throughout the Relevant Class Period.

    - Dr. Feinstein selected the economically arbitrary date of August 20, 2013 to bifurcate the Relevant Class Period. In my opinion, it makes more economic sense to divide the Relevant Class Period based on ARCP's February 7, 2014 acquisition of Cole Real Estate Investments, Inc. ("Cole"). I refer to the period before February 7, 2014 as the "Pre-Cole Period" and the period from February 7, 2014 to October 29, 2014 as the "Post-Cole Period."

    - Dr. Feinstein's analysis of ARCP's common stock price reaction on his subjectively determined subset of 8-K filing dates does not reliably establish a cause-and-effect relationship. He only included 8-K filing dates on which he also identified an analyst report mentioning the information contained in the 8-K filing. This selection criterion biased Dr. Feinstein's analysis towards finding purported evidence of a price reaction to news. Despite this bias, Dr. Feinstein's 8-K analysis still does not provide evidence that ARCP's common stock traded in an efficient market in the Pre-Cole Period.

    - Dr. Feinstein failed to test whether ARCP's common stock price reacted to information disclosed on earnings release dates. Had Dr. Feinstein used these dates, his analysis would not support the conclusion that ARCP's common stock traded in an efficient market during the Relevant Class Period. Dr.

Feinstein's failure to test earnings release dates is inconsistent with his own publication on the use of event studies to assess market efficiency. It is also inconsistent with academic literature on which Dr. Feinstein relies elsewhere in his report. Earnings release dates are particularly relevant in this matter given that the allegations concern earnings and financial results.

- Dr. Nye's event study fails to demonstrate that ARCP's common stock price reacted to new and material information. Dr. Nye, unlike Dr. Feinstein, tested ARCP's common stock price reaction on earnings release dates. However, he failed to employ valid statistical testing. Correcting for his methodological error shows that Dr. Nye's event study fails to demonstrate a cause-and-effect relationship between news and ARCP's common stock price during the Relevant Jet Capital Period.

- *Dr. Feinstein's analyses of the ARCP Notes are flawed and do not demonstrate that these securities traded in an efficient market during the Relevant Class Period* (**Section VI.**).

  - Dr. Feinstein fails to properly account for the important differences among the various ARCP Securities when evaluating the market efficiency for the markets in which they trade. Dr. Feinstein acknowledges that some of these debt instruments changed from 144A to registered securities immediately prior to the end of the Relevant Class Period. Nonetheless, he improperly uses data from after the Relevant Class Period to arrive at his conclusions regarding the ARCP Notes during the Relevant Class Period. These debt securities were unregistered (*i.e.*, 144A securities) for nearly all of the Relevant Class Period, whereas they were registered securities for the entirety of the period following the Relevant Class Period that Dr. Feinstein chose to analyze.

  - Dr. Feinstein also fails to make important adjustments to the TRACE data on which he relies for his analysis of the ARCP Notes. Correcting for these errors materially changes Dr. Feinstein's results with respect to the evaluation of certain indirect *Cammer* factors. Dr. Feinstein ignores other evidence that the market for the ARCP Notes exhibited infrequent trading and limited price transparency.

  - In addition, the *only* event date that Dr. Feinstein tests for the ARCP Notes is October 29, 2014, which, as previously described, is biased and not informative of market efficiency throughout the Relevant Class Period.

  - Despite the flaws in Dr. Feinstein's model, I used his model to test whether the ARCP Notes reacted to news disclosed on Dr. Feinstein's selected 8-K filing dates, earnings announcement dates, and credit rating event dates. The ARCP Notes did not react to any of these events during the Relevant Class Period, further calling into question Dr. Feinstein's conclusion that these securities traded in an efficient market during the Relevant Class Period.

- *Dr. Feinstein's analysis of ARCP's preferred stock suffers from similar shortfalls and fails to establish that the securities traded in an efficient market during the Relevant Class Period* (**Section VII.**).
    - The *only* event date that Dr. Feinstein tests for the ARCP preferred stock is October 29, 2014, which, as previously described, is biased and not informative of market efficiency throughout the Relevant Class Period.
    - I tested whether ARCP's preferred stock reacted to other news disclosed on Dr. Feinstein's selected 8-K filing dates, earnings announcement dates, and credit rating event dates and found that it did not.

8. I further conclude that there is affirmative evidence that ARCP's common stock traded in an inefficient market during portions of the Relevant Class Period. Below is a summary of my opinions in reaching this conclusion.

- *Investors could have exceeded returns earned from a buy-and-hold strategy by employing a trading strategy based on prior ARCP common stock returns.* I present evidence that ARCP's common stock does not pass a test for weak-form market efficiency, which is a prerequisite for semi-strong efficiency. Specifically, I demonstrate that, during the Post-Cole Period and the Relevant Jet Capital Period, an investor could have devised a mechanical trading rule based on ARCP's common stock past returns that would outperform a buy-and-hold strategy. As discussed in the academic literature I cite in my report, this finding contradicts the fundamental notion of a "random walk" of securities prices in weak-form efficient markets **(Section V.A.4.** and **Section V.B.)**.
- *Dr. Nye's test for autocorrelation is not a complete analysis of weak-form efficiency.* Dr. Nye attempted to address this same issue by performing a test for autocorrelation. While this is one test of weak-form efficiency, it is not the only one and, as I describe, ARCP's common stock does not pass other more sophisticated tests **(Section V.B.)**.

9. In the sections that follow, I first provide an overview of market efficiency in the context of securities class actions and Plaintiffs' experts' approaches to assessing market efficiency. I then describe academic studies that highlight the limitations of the indirect *Cammer* and *Krogman* factors that Plaintiffs' experts evaluated. Next, I assess Plaintiffs' experts' analyses of the fifth *Cammer* factor for each of the ARCP Securities and explain

why their analyses fail to reliably demonstrate a cause-and-effect relationship between news and the prices of the ARCP Securities.

III. OVERVIEW OF MARKET EFFICIENCY IN THE CONTEXT OF SECURITIES CLASS ACTIONS

10. Economists consider a market for a security efficient when it quickly impounds new and material information into the security's price. As acknowledged by Plaintiffs' experts, there are three recognized variants of the efficient market hypothesis, distinguished by the degree and type of information incorporated into a security's price:[7]

1) **Weak-form efficiency:** Under this theory, the price of a security quickly incorporates all of the information contained in the history of the security's prior prices. That is, future price movements cannot be predicted based on past price movements.
2) **Semi-strong-form efficiency:** Under this theory, the price of a security quickly incorporates all publicly available information.
3) **Strong-form efficiency:** Under this theory, the price of a security quickly incorporates both public *and* private information.[8]

11. Each form of efficiency builds on the previous form such that weak-form efficiency is a prerequisite for semi-strong form efficiency, and semi-strong form efficiency is a prerequisite for strong-form efficiency.

12. In the context of securities litigation, the term "market efficiency" typically refers to the semi-strong form.[9] As defined in the academic literature, under semi-strong market

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[7] *See* Nye Report, n. 12. *See also* Steven P. Feinstein, "Teaching the Strong-Form Efficient Market Hypothesis and Making the Case for Insider Trading: A Classroom Experiment," *Journal of Financial Education,* Vol. 26 (Fall 2000), pp. 40-44.

[8] *See, e.g.*, Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance*, 1970, pp. 383-417.

[9] The Supreme Court has stated that "the Court [in *Basic*] relied upon the 'semi-strong' version of [efficient markets] theory, which posits that the average investor cannot earn above-market returns (*i.e.*, 'beat the market') in an efficient market trading on the basis of publicly available information." *Halliburton Co. v. Erica P. John Fund, Inc.*, 134 S. Ct. 636 (2013).

efficiency, the current price of a security fully incorporates all publicly available information.[10] This is consistent with the type of market efficiency that the Supreme Court discussed in the *Basic v. Levinson* decision.[11] Efficient market theory posits that investors rely on the market price of a security because prices quickly impound *all publicly available information* about the value of the security.[12] This reliance is the basis for the fraud-on-the-market presumption central to securities class actions. For example, as discussed in the *Basic v. Levinson* decision:

> The fraud on the market theory is based on the hypothesis that, in an open and developed securities market, the price of a company's stock is determined by the available material information regarding the company and its business. … Misleading statements will therefore defraud purchasers of stock even if the purchasers do not directly rely on the misstatements…. The causal connection between the defendants' fraud and the plaintiffs' purchase of stock in such a case is no less significant than in a case of direct reliance on misrepresentations.[13]

13. To assess market efficiency for the ARCP Securities, Plaintiffs' experts evaluated two sets of factors: (1) the five "*Cammer* factors," as enumerated in *Cammer v. Bloom*; and (2) the three "*Krogman* factors," as described in *Krogman v. Sterritt*.[14] Dr. Nye also evaluated whether ARCP's common stock exhibited autocorrelation.[15] The five *Cammer* factors are:[16]

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[10] *See, e.g.*, Eugene Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance*, 1970, p. 404.

[11] *See Basic, Inc. v. Levinson*, 485 U.S. 224, 246-247 (1988).

[12] *See, e.g.*, Richard Brealey, Stewart Myers, and Franklin Allen, Principles of Corporate Finance, 10th Edition, McGraw-Hill Irwin, 2011, p. 330. *See also, e.g.*, Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance*, 1970, pp. 383-417.

[13] *Basic, Inc. v. Levinson*, 485 U.S. 224, 241-242 (1988).

[14] *See* Feinstein Report, ¶17. *See also* Nye Report, ¶¶13, 14.

[15] *See* Nye Report, ¶56.

[16] *Cammer v. Bloom*, 711 F. Supp. 1286, 1287 (D.N.J. 1989).

1) whether the stock exhibited "average weekly trading of two percent or more of the outstanding shares";

2) whether a "significant number of securities analysts followed and reported on a company's stock during the class period";

3) whether the "stock had numerous market makers" or other evidence of "arbitrageurs";

4) whether the "Company was entitled to file an S-3 Registration Statement in connection with public offerings"; and

5) whether there are "empirical facts showing a cause and effect relationship between unexpected corporate events or financial releases and an immediate response in the stock price."

14. The first four *Cammer* factors are commonly referred to as "indirect" indicators of market efficiency. The *Cammer* decision describes the fifth factor as the "essence of an efficient market."[17] Similarly, Dr. Feinstein acknowledges that the fifth factor "focuses on the essence of market efficiency whereas the other four factors are indicators that generally signal market efficiency."[18]

15. The three *Krogman* factors, which do not provide direct evidence of market efficiency, include:[19]

1) The market capitalization of the company;

2) The typical bid-ask spread; and

3) The percentage of stock not held by insiders.

[17] *Cammer v. Bloom*, 711 F. Supp. 1264, 1287 (D.N.J. 1989).

[18] Feinstein Report, ¶110.

[19] *See Krogman v. Sterritt*, 202 F.R.D. 467 (N.D. Tex. 2001).

IV. THE INDIRECT *CAMMER* AND *KROGMAN* FACTORS ARE NOT SUFFICIENT TO ESTABLISH MARKET EFFICIENCY

16. Dr. Feinstein asserts that the indirect *Cammer* and *Krogman* factors are "indicative of market efficiency," and Dr. Nye describes them as "indirect indicators, of market efficiency."[20] In my opinion, from an economic perspective, the indirect *Cammer* and *Krogman* factors are not sufficient to establish market efficiency.

A. Academic Studies Demonstrate that Indirect Factors Are Not Dispositive of Market Efficiency

17. Academic studies show that there are many instances where securities that fulfill the first four *Cammer* factors and the three *Krogman* factors (that is, the indirect tests) still trade in inefficient markets. For example, Dr. Feinstein cites an article by Barber, et al. in which the authors acknowledge the apparent absence of a "systematic body of evidence showing that [the *Cammer* and *Krogman* factors] or any other criteria distinguish between efficient and inefficient stocks."[21] The authors proposed "to measure the efficiency of a firm's security price by analyzing the stock price response to the announcement of unexpected earnings."[22] They therefore proposed performing a *direct* test of market efficiency, thus recognizing the existence of a cause-and-effect relationship between news and security prices as the standard for an efficient market.

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[20] Feinstein Report, ¶¶54, 55, 59; Nye Report, ¶13.

[21] *See* Feinstein Report, ¶¶54. Brad M. Barber, et al., "The Fraud-on-the-Market Theory and the Indicators of Common Stocks' Efficiency," *Journal of Corporation Law* 19, 1994, p. 290.

[22] Brad M. Barber, et al., "The Fraud-on-the-Market Theory and the Indicators of Common Stocks' Efficiency," *Journal of Corporation Law* 19, 1994, p. 294.

18. Another study by Erenburg, et al. (2011) tested three of the indirect *Cammer* factors and two of the *Krogman* factors[23] and found that "the *Cammer* and *Krogman* factors that [they] examine exhibit little relation to weak-form market efficiency."[24] In addition, the authors concluded that "[t]he evidence does not support the blanket presumption of market efficiency for NYSE-listed firms."[25] Similarly, the authors found that the number of analysts covering a stock "is essentially neutral, rather than implying market efficiency."[26] And, yet again, with respect to the *Cammer* factor related to share turnover (that is, trading volume), the authors found that "the net relationship [between turnover and weak-form efficiency] is in the opposite direction of the *Cammer* court's intuition."[27] That is, "on net, inefficient pricing induces more trading" rather than less.[28]

19. Erenburg, et al. (2011) reached similar conclusions regarding the *Krogman* factors. For example, with respect to evaluating market efficiency based on a firm's market capitalization, the authors found that "high-market-cap firms have more positive serial

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[23] The indirect *Cammer* factor not tested by Erenburg et al. (2011) is the fourth *Cammer* factor (whether the firm is eligible to file an S-3 registration statement). Erenburg et al. (2011) did not test the third *Krogman* factor (or the percentage of stock held by insiders). Grigori Erenburg, et al., "The Paradox of 'Fraud-on-the-Market Theory': Who Relies on the Efficiency of Market Prices?", *Journal of Empirical Legal Studies*, Vol. 8, Issue 2, 2011, n. 31.

[24] Grigori Erenburg, et al., "The Paradox of 'Fraud-on-the-Market Theory': Who Relies on the Efficiency of Market Prices?", *Journal of Empirical Legal Studies*, Vol. 8, Issue 2, 2011, p. 292.

[25] Grigori Erenburg, et al., "The Paradox of 'Fraud-on-the-Market Theory': Who Relies on the Efficiency of Market Prices?", *Journal of Empirical Legal Studies*, Vol. 8, Issue 2, 2011, p. 289.

[26] Grigori Erenburg, et al., "The Paradox of 'Fraud-on-the-Market Theory': Who Relies on the Efficiency of Market Prices?", *Journal of Empirical Legal Studies*, Vol. 8, Issue 2, 2011, p. 290.

[27] Grigori Erenburg, et al., "The Paradox of 'Fraud-on-the-Market Theory': Who Relies on the Efficiency of Market Prices?", *Journal of Empirical Legal Studies*, Vol. 8, Issue 2, 2011, p. 291.

[28] Grigori Erenburg, et al., "The Paradox of 'Fraud-on-the-Market Theory': Who Relies on the Efficiency of Market Prices?", *Journal of Empirical Legal Studies*, Vol. 8, Issue 2, 2011, p. 291.

correlation than other firms," which is indicative of market *inefficiency*.[29] Finally, with respect to the *Krogman* court's conclusion that efficient stocks will exhibit a narrower bid-ask spread, Erenburg, et al. (2011) found instead that "profitable momentum trading (economically significant weak-form inefficiencies) is more likely for firms with narrower spreads."[30] In summary, the Erenburg, et al. (2011) paper demonstrates that the indirect factors are inadequate to reach conclusions regarding market efficiency, ***and that some of the indirect factors are more likely to exist if the stock in question is inefficient***.

20. Several other academic studies highlight cases where a company's stock "passes" the tests associated with most, and in some cases all, of the *Cammer* factors and yet trades in an inefficient market. Some of these examples highlight instances where apparent arbitrage opportunities persisted for extended periods.[31] For example, Lamont and Thaler (2003a) and Fedenia and Hirschey (2009) identified examples in which two classes of shares with known relative claims on the underlying company's cash flows nevertheless traded at prices that were inconsistent with those relative claims.[32] Another study by

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[29] Grigori Erenburg, et al., "The Paradox of 'Fraud-on-the-Market Theory': Who Relies on the Efficiency of Market Prices?", *Journal of Empirical Legal Studies*, Vol. 8, Issue 2, 2011, p. 291.

[30] Grigori Erenburg, et al., "The Paradox of 'Fraud-on-the-Market Theory': Who Relies on the Efficiency of Market Prices?", *Journal of Empirical Legal Studies*, Vol. 8, Issue 2, 2011, p. 292.

[31] *Cammer* recognized the importance of arbitrageurs: "The existence of market makers and arbitrageurs would ensure completion of the market mechanism; these individuals would react swiftly to company news and reported financial results by buying or selling stock and driving it to a changed price level." *Cammer v. Bloom*, 711 F. Supp. 1264, 1286-87 (D.N.J. 1989). However, the mere existence of arbitrageurs in a market does not ensure that the market is efficient. In other words, there may be limits to arbitrage. *See, e.g.*, Andrei Shleifer and Robert W. Vishny, "The Limits of Arbitrage," *The Journal of Finance*, Vol. 52, No. 1, March 1997, pp. 35-55.

[32] Owen Lamont and Richard Thaler, "The Law of One Price in Financial Markets," *Journal of Economic Perspectives* 17, 2003, pp. 191-202; Mark Fedenia and Mark Hirschey, "The Chipotle Paradox," *Journal of Applied Finance*, Vol. 19, 2009, p. 146. A later paper by Bajaj, et al. (2014) confirmed that the stocks analyzed in these papers fulfilled the *Cammer* factors. *See* Mukesh Bajaj et al., "Assessing Market Efficiency for

Lamont and Thaler (2003b) identified five examples of spinoff initial public offerings where the spinoff's post-offering price was so high for at least a two-month period that the implied standalone value of the parent company that retained a large ownership share in the spinoff was negative.[33]

21. Still other studies researched pricing anomalies for stocks that meet many of the *Cammer* and *Krogman* factors. These pricing anomalies include the reaction of stocks to news already known to the market, indicating a lack of semi-strong form efficiency. For example, the stock of a biotech firm generated a 330 percent return after a *New York Times* article mentioned a research breakthrough, even though various news outlets, including the *New York Times* itself, had previously published that same news several months prior.[34] Another study found that the markets for a large cross section of stocks experienced reactions to stale news.[35] In a market exhibiting semi-strong form efficiency, prices should have already incorporated stale news by the time the repeated "news" is released, implying that there should not be a significant abnormal return (in contrast to the reaction observed by these studies).[36]

Reliance on the Fraud-on-the-Market Doctrine after *Wal-Mart* and *Amgen*," *Research in Law and Economics*, Vol. 26, 2014, pp. 185-187.

[33] Owen Lamont and Richard Thaler, "Can the Market Add and Subtract? Mispricing in Tech Stock Carve-Outs," *Journal of Political Economy* 111, 2003, pp. 233, 235. Bajaj, et al. (2014) confirmed that these stocks fulfilled the Cammer factors as well. *See* Mukesh Bajaj et al., "Assessing Market Efficiency for Reliance on the Fraud-on-the-Market Doctrine after *Wal-Mart* and *Amgen*," *Research in Law and Economics*, Vol. 26, 2014, pp. 185-187.

[34] Gur Huberman and Tomer Regev, "Contagious Speculation and a Cure for Cancer: A Nonevent that Made Stock Prices Soar," *The Journal of Finance*, Vol. 56, No. 1, February 2001, pp. 391-392.

[35] Paul C. Tetlock, "All the News That's Fit to Reprint: Do Investors React to Stale Information?", *The Review of Financial Studies*, Vol. 24, No. 5, 2011, pp. 1481-1512.

[36] On a given day, a wide range of information may affect a publicly traded security's price. Such information includes, for example, market- and/or industry-specific factors, as well as company-specific news. Financial economists use regression analysis, hereafter referred to as an "event study," in an effort to isolate the part of

22. In my view, these studies demonstrate that an evaluation of the indirect *Cammer* and *Krogman* factors is not sufficient to establish market efficiency.

B. The Fifth *Cammer* Factor Is the Only *Cammer* Factor that Provides Direct Evidence of Whether a Security Trades in an Efficient Market

23. Given the insufficiency of the indirect *Cammer* and *Krogman* factors for demonstrating market efficiency, the fifth *Cammer* factor is of critical importance. In my opinion, and consistent with the academic literature described above, the fifth *Cammer* factor is the only factor that provides direct evidence of whether a security trades in an efficient market.

24. Similarly, research that Dr. Feinstein references in his report clearly delineates between the indirect *Cammer* and *Krogman* factors and the fifth *Cammer* factor with respect to their ability to demonstrate market efficiency for a given security. Specifically, Dr. Feinstein cited an article by Ferrillo et al. (2004) that states:[37]

> [J]ust relying on many of Cammer's factors does not necessarily prove that the stock in question behaved in an efficient manner. Many of the factors, like the existence of market makers and coverage by securities analysts, do not even go to the market behavior of a stock. Other factors, like the average weekly trading volume, are imprecise as well, and certainly do not show or prove market efficiency. Indeed, during the Internet boom, many stocks exhibited relatively high average weekly trading volumes, but also behaved in a volatile manner, often rising many dollars per share without the disclosure of news or material information concerning the company.

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the daily stock return that is attributable to market and industry factors. The remainder is referred to as the "abnormal" return.

[37] Feinstein Report, ¶153. Paul A. Ferrillo, et al., "The 'Less Than' Efficient Capital Markets Hypothesis: Requiring More Proof from Plaintiffs in Fraud-on-the-Market Cases," *St. John's Law Review*, Volume 78, Winter 2004, Number 1, p. 128.

25. In Sections V, VI, and VII below, I provide the basis for my conclusion that Dr. Feinstein failed to establish reliable evidence of a cause-and-effect relationship between company-specific news and the prices of the ARCP Securities. In Section V, I also provide the basis for my conclusion that Dr. Nye also failed to establish that ARCP's common stock traded in an efficient market.

V. PLAINTIFFS' EXPERTS FAIL TO RELIABLY ESTABLISH A CAUSE-AND-EFFECT RELATIONSHIP BETWEEN NEWS AND ARCP'S COMMON STOCK PRICE

A. Dr. Feinstein's Analyses of the Fifth *Cammer* Factor for ARCP's Common Stock Are Flawed and Fail to Demonstrate Market Efficiency

26. Dr. Feinstein performed three empirical tests to assess whether the price of ARCP's common stock incorporated new and material information. These tests include:[38]

- An event study to investigate whether ARCP's common stock price reacted to the release of the allegedly corrective information on the last day of the Relevant Class Period;[39]
- An event study to test ARCP's common stock price reaction on selected dates on which ARCP filed an 8-K and the information was also mentioned in an analyst report ("8-K Event Dates"), and an evaluation of whether these 8-K Event Dates exhibited statistically significant stock returns more frequently than "ordinary days" (*i.e.*, "non-8-K Event Dates");[40] and
- Volatility tests to examine whether the price of ARCP's common stock price exhibited "greater dispersion and larger stock price movements" on the 8-K Event Dates than on non-8-K Event Dates. [41]

27. Dr. Feinstein conducted his event studies over three periods: (i) the entire Original Class Period; (ii) May 9, 2012 through August 19, 2013 ("Interval-1"); and (iii) August 20,

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38 *See* Feinstein Report, ¶¶111-115.

39 *See* Feinstein Report, ¶112.

40 *See* Feinstein Report, ¶114.

41 *See* Feinstein Report, ¶115.

2013 through October 29, 2014 ("Interval-2").[42,43] Based on his empirical tests, Dr. Feinstein concluded that, "the ARCP common stock traded in an efficient market."[44] However, as I describe below, Dr. Feinstein's analyses are flawed and do not provide a reliable basis for his conclusion.

1. Dr. Feinstein's Test of the Last Day of the Relevant Class Period Is Methodologically Unsound

28. Dr. Feinstein's analysis of ARCP's common stock price reaction on October 29, 2014 is improper for at least two key reasons. First, testing October 29, 2014 biases the test towards finding a statistically significant abnormal return because ARCP's common stock declined 19.2 percent on that day, the single largest stock price decline during the Relevant Class Period.[45] The magnitude of the price change on this day is nearly four times as large as the second largest change during the Relevant Class Period.[46] Therefore, the decline on October 29, 2014 is not only the largest decline, but also a clear outlier during the Relevant Class Period. This all but guarantees that Dr. Feinstein's event study would find a statistically significant abnormal return on this day. Statistical analyses that predetermine the outcome of their investigation, such as Dr. Feinstein's

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42 *See* Feinstein Report, ¶¶138, 140. Dr. Feinstein's event study used logarithmic returns adjusted for dividends *(i.e.*, the natural logarithm of the ratio of the current day's closing price, plus dividends, to the previous day's closing price), and controlled for days on which ARCP filed an 8-K.

43 Dr. Feinstein defined the two sub-intervals, Interval-1 and Interval-2, based on the August 20, 2013 8-K announcement that ARCP would "become self-managed following the pending closings of the previously announced acquisitions of CapLease, Inc. and American Realty Capital Trust IV, Inc." *See* Feinstein Report., n. 95.

44 Feinstein Report, ¶184.

45 ARCP's closing stock price on October 28, 2014 was $12.38 and its closing stock price on October 29, 2014 was $10.00, a decline of 19.2 percent. *See* Feinstein Report, Exhibit-4.

46 The second largest change in the ARCP stock price was on March 20, 2013, when the ARCP stock price increased approximately five percent (from $13.93 on March 19, 2013 to $14.66 on March 20, 2013). *See* Feinstein Report, Exhibit-4.

analysis, are not reliable or consistent with the professional standards for statistical testing.[47]

29. Importantly, Dr. Feinstein's methodology of using the single largest stock price decline during the Relevant Class Period to evaluate the efficiency of the market for ARCP's common stock through the entire period is at odds with his own published work. For example, in a recent paper that Dr. Feinstein co-authored, titled "Stock Price Reactivity to Earnings Announcements: The Role of Cammer/Krogman Factors," Dr. Feinstein stated, "[t]o be valid, *event selection must be objective*."[48] In my opinion, Dr. Feinstein's selection of the highest negative outlier during the Relevant Class Period as the event date to test does not represent an objective event-selection methodology.

30. Dr. Feinstein's approach is also at odds with publications that Dr. Feinstein cites in his report. In particular, when discussing the Z-test methodology, the authors of Ferrillo et al. (2004) state that "[t]he examination would exclude those days in which a corrective disclosure was made because plaintiffs would normally choose a class period where corrective disclosures coincide with large negative price movements" and that "including those days in the analysis would bias the results."[49] Similarly, another publication states

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47 *See* Ethical Guidelines for Statistical Practice, Prepared by the Committee on Professional Ethics of the American Statistical Association, April 14, 2018, p. 3.

48 Miguel Villanueva and Steven P. Feinstein, "Stock Price Reactivity to Earnings Announcements: The Role of Cammer/Krogman Factors," March 29, 2019, p. 3 (emphasis added).

49 Paul A. Ferrillo, et al., "The 'Less Than' Efficient Capital Markets Hypothesis: Requiring More Proof from Plaintiffs in Fraud-on-the-Market Cases," *St. John's Law Review*, Volume 78, Winter 2004, Number 1, n. 155.

that using the last day of the class period in statistical tests for market efficiency introduces a "selection-bias issue."[50]

31. Second, Dr. Feinstein's test of October 29, 2014 is unreliable because it tests only a single date of the Relevant Class Period, a period with 422 trading days— *i.e.*, it provides little or no information about the remaining 421 trading days in the Relevant Class Period.[51] I am not aware of any peer-reviewed academic literature that recommends testing only a single date when evaluating the efficiency of the market for a given stock over an extended period. To the contrary, the academic literature recognizes that the market for a given security can become inefficient over time and therefore recommends analyzing events throughout the entire period of interest.[52] Furthermore, Ferrillo et al. (2004) describes testing a single date as noncompliant with the "scientific method."[53] The authors state that, "[m]erely demonstrating a single or small number of cases where there is an apparent cause and effect relationship is not enough [to demonstrate market efficiency], since this measures only one point in time during the class period, and only the stock's response to one or a handful of disclosures."[54]

32. Relatedly, news items of particular importance may move stock prices, but that does not necessarily mean that the stock price quickly impounds new, material information in

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50 David I. Tabak, "What Should We Expect When Testing for Price Response to News in Securities Litigation?", August, 2016, pp. 2, 15.

51 *See* Feinstein Report, Exhibit-4.

52 *See, e.g.*, *See* Mukesh Bajaj et al., "Assessing Market Efficiency for Reliance on the Fraud-on-the-Market Doctrine after *Wal-Mart* and *Amgen*," *Research in Law and Economics*, Vol. 26, 2014, pp. 190-192.

53 Paul A. Ferrillo, et al., "The 'Less Than' Efficient Capital Markets Hypothesis: Requiring More Proof from Plaintiffs in Fraud-on-the-Market Cases," *St. John's Law Review*, Volume 78, Winter 2004, Number 1, p. 128.

54 Paul A. Ferrillo, et al., "The 'Less Than' Efficient Capital Markets Hypothesis: Requiring More Proof from Plaintiffs in Fraud-on-the-Market Cases," *St. John's Law Review*, Volume 78, Winter 2004, Number 1, p. 128.

general over the Relevant Class Period. Instead, it shows at most that the market reacted to one extraordinary piece of information. It does not show that the market reacted throughout the Relevant Class Period to less extraordinary but nevertheless new and material information. A paper by Cornell and Rutten (2006) similarly states that, "even a grossly inefficient market will incorporate to some degree news about extremely significant events."[55]

33. In summary, Dr. Feinstein's test of October 29, 2014 is unreliable because its outcome is predetermined to find a statistically significant price reaction and because it does nothing to directly evaluate whether ARCP's common stock quickly impounded new and material information during the remaining 421 (out of 422) trading days in the Relevant Class Period. As a result, Dr. Feinstein's test of October 29, 2014 does not provide any direct evidence that ARCP's common stock traded in an efficient market throughout the Relevant Class Period.

2. Dr. Feinstein's Collective Event Study of 8-K Event Dates Is Flawed and Does Not Support His Conclusion

34. Dr. Feinstein also tested for market efficiency by conducting a Z-test to determine whether the ARCP common stock had a greater proportion of statistically significant abnormal returns on so-called "8-K Event Dates" than on non-8-K Event Dates.[56] From these tests, Dr. Feinstein concluded that there is empirical evidence of market efficiency throughout the Original Class Period.[57] However, as I discuss in the sections below, Dr.

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[55] Bradford C. Cornell and James Rutten, "Market Efficiency, Crashes, and Securities Litigation," *Tulane Law Review*, Vol. 81, 2006, n. 55.

[56] *See* Feinstein Report, ¶113.

[57] *See* Feinstein Report, ¶114, 151, 155, 157, 159.

Feinstein's analysis suffers from a number of methodological flaws and mistakes. When corrected, Dr. Feinstein's 8-K Event Dates analysis does not support his conclusions regarding the efficiency of the market for ARCP's common stock.

a. Dr. Feinstein's Selection of Time Intervals Is Arbitrary and the Results of His Event Study Are Not Robust

35. Dr. Feinstein divided the Original Class Period based on ARCP's announcement on August 20, 2013 that it "would become self-managed following the pending closings of the previously announced acquisitions of CapLease, Inc. and American Realty Capital Trust IV, Inc."[58] Dr. Feinstein used this announcement date to define his two sub-intervals because of "the [purported] timing and the importance of this event in the life of the Company."[59] I disagree with Dr. Feinstein's choice of dates.

36. As shown in **Exhibit 1,** ARCP's acquisition of Cole, which closed on February 7, 2014, substantially increased ARCP's market capitalization. As the exhibit shows, the Cole transaction increased ARCP's market capitalization from approximately $3 billion to over $10 billion. Not surprisingly, analyst commentary following the announcement of the Cole acquisition further confirms the importance of this transaction. For example:

- Janney Capital Markets noted: "The deal, valued at approximately $11.2 billion, would create the largest triple net REIT in the sector with a total enterprise value of $21.5 billion compared to approximately $13 billion for Realty Income … the current largest participant in the space. ARCP's portfolio would have more than 3,700 properties and 100 million square feet."[60]
- BMO Capital Markets noted: "We are upgrading ARCP to Outperform from Market Perform. The acquisition of COLE addresses our two biggest concerns:

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58 Feinstein Report, ¶140, n. 95.

59 Feinstein Report, n. 95.

60 "ARCP Announces Agreement To Acquire Cole Real Estate For $11.2 Billion," Janney Capital Markets, October 23, 2013.

> leverage and structure, while creating a major Net Lease REIT with a high-quality portfolio and financial flexibility."[61]

37. The closing of the Cole transaction on February 7, 2014, unlike the August 20, 2013 announcement that Dr. Feinstein chose, is an event that substantially changed ARCP and its common stock. Therefore, I adjust Dr. Feinstein's 8-K analysis to use the Pre-Cole and Post-Cole periods rather than his Interval-1 and Interval-2 periods. In **Exhibit 2A**, I use the models that Dr. Feinstein produced to adjust his results presented in Exhibit-10 of the Feinstein Report to instead reflect the Pre-Cole Period and the Post-Cole Period.[62] Using this model, there are four news days in the Pre-Cole period that are statistically significant. **Exhibit 2A** presents three statistical tests that test whether the difference in the proportion of significant 8-K Event Dates and the proportion of significant non-8-K Event Dates is statistically significant: Z-test with pooled variance, Z-test with unpooled variance, and Fisher's Exact test.[63,64] In my opinion, because of the small sample of

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61 "Returns Fueled by COLE; Upgrade to Outperform," BMO Capital Markets, October 24, 2013.

62 In **Exhibit 2A**, I rely on the regression results in Exhibit-8b and Exhibit-8c in the Feinstein Report. In particular, for all dates prior to August 20, 2013, I rely on Dr. Feinstein's regression results presented in his Exhibit 8-b, and, for all dates from August 20, 2013 through October 29, 2014, I rely on Dr. Feinstein's regression results presented in his Exhibit 8-c. I note that, in relying on Dr. Feinstein's regression results in **Exhibit 2A** (and in any of my following analyses), I am not endorsing his specific model. Rather, I am using his regression model to demonstrate the difference that his choice of date to divide the Relevant Class Period makes, all else being equal.

63 I note that in his Z-test in Exhibit-10, Dr. Feinstein used a "pooled" estimate of the standard deviations based on both groups of event dates. Thus, Dr. Feinstein assumed that the abnormal returns on 8-K Event Dates and non-8-K Event Dates have common variability. *See* "Feinstein Exhibit Stack (SF0033381).xlsx." I also conducted a Z-test with "unpooled" variances. The use of a Z-test with unpooled variances does not assume equal variability between the two groups of event dates and is appropriate in this matter given the differences in size between the two groups. The use of a Z-test with unpooled variances is also consistent with the Ferrillo et al. (2004) article, which Dr. Feinstein relies on to motivate his collective event study of 8-K Event Dates. *See* Feinstein Report, ¶153. *See also* Paul A. Ferrillo, et al., "The 'Less Than' Efficient Capital Markets Hypothesis: Requiring More Proof from Plaintiffs in Fraud-on-the-Market Cases," *St. John's Law Review*, Volume 78, Winter 2004, Number 1, n. 158.

64 I also present results using Fisher's Exact test due to the small sample sizes in the analyses. As Dr. Feinstein has acknowledged in his publication outside of this litigation, the "Z-test may be unreliable in small samples" and "the Fisher exact test … gives correct probability values even in small samples." Miguel Villanueva and Steven P. Feinstein, "Stock Price Reactivity to Earnings Announcements: The Role of Cammer/Krogman Factors," March 29, 2019, n. 11.

news days in many of these tests, Fisher's Exact Test is the preferred test and, of the two Z-tests presented, the unpooled variance is the preferred test. In any case, as the exhibit shows, based on both the Z-tests and Fisher's Exact test, there is not a statistically significant difference in the proportion of significant 8-K Event Dates and the proportion of significant non-8-K Event Dates during the Pre-Cole Period. Thus, Dr. Feinstein's own model, when corrected to a more appropriate division of the Relevant Class Period, does not provide support for a finding of market efficiency for the ARCP common stock during the Pre-Cole Period.

38. Additionally, Dr. Feinstein's 8-K analysis sets a low threshold for establishing market efficiency and, as I discuss later in this section, biases the test towards finding purported evidence in favor of market efficiency. Dr. Feinstein compares the proportion of significant 8-K Event Dates with the proportion of significant non-8-K Event Dates without acknowledging that, in an efficient market, one might reasonably expect these selected 8-K Event Dates to have a substantially higher percentage of statistically significant returns than all other days. For example, suppose that 80 percent of Mr. Feinstein's selected news days should exhibit a significant abnormal return in an efficient market. Simply testing whether a higher proportion of 8-K Event Dates have a statistically significant abnormal return compared to non-8-K Event Dates is not compelling evidence.

39. Furthermore, Dr. Feinstein's results for the Pre-Cole period are not robust, making any conclusion drawn from his analysis unreliable. As I demonstrate below, small modifications to Dr. Feinstein's analysis lead to changes in the statistical significance of the Z-tests and Fisher's Exact test. Specifically, I made two modifications to Dr.

Feinstein's analysis.[65] In the first alternative, I re-run Dr. Feinstein's model, but estimate it separately over the Pre-Cole and Post-Cole periods. **Exhibit 2B** shows that this approach similarly finds four statistically significant news days in the Pre-Cole period. However, many of the non-news days that were significant in **Exhibit 2A** are no longer significant, which lowers the proportion of non-8-K Event Dates that have significant returns while keeping the proportion of 8-K Event Dates with significant returns the same. This increases the difference in proportions between 8-K Event Dates and non-8-K Event Dates and causes the Z-test and Fisher's Exact test to find a significant difference between them. Were Dr. Feinstein's original results robust, this would not occur. In the second alternative method, I estimate Dr. Feinstein's model over the entire Relevant Class Period, using an indicator variable to differentiate between the Pre-Cole and Post-Cole periods.[66] **Exhibit 2C** shows that, under this approach, there are five statistically significant news days and 15 statistically significant non-news days. The Z-test (with unpooled variance) does not find a statistically significant difference in the proportions of significant events on 8-K Event Dates and non-8-K Event Dates, whereas Fisher's Exact test does. Again, this would not have occurred were Dr. Feinstein's original results robust. Taken together, **Exhibits 2A, 2B, and 2C** demonstrate how sensitive Dr. Feinstein's results are to small modifications to his model. In my opinion, these conflicting findings do not support a reliable conclusion that, even putting aside other

[65] Because Dr. Feinstein has not submitted an updated report that reflects the revised Relevant Class Period, I use the underlying data Dr. Feinstein produced and removed the period prior to the Relevant Class Period (*i.e.*, the period between May 9, 2012 and February 27, 2013).

[66] This indicator variable always equals one during the Post-Cole period and zero during the Pre-Cole period, and therefore captures any changes in ARCP price dynamics following the Cole acquisition.

criticisms of Dr. Feinstein's approach described below, the ARCP common stock traded in an efficient market during the Pre-Cole period.

b. Dr. Feinstein's Methodology for Selecting News Event Dates Is Biased and Difficult to Reliably Replicate

40. Dr. Feinstein's 8-K Event Dates analysis relies on an event date-selection process that biases the tests towards finding dates with statistically significant abnormal returns. Rather than testing all 200 8-K dates during the Original Class Period, Dr. Feinstein imposed a second-step of the date identification process, including only the 45 dates on which he identified an analyst report mentioning news contained in the 8-K. This second step, however, is subjective, and it biases the analysis because analysts often decide to issue reports precisely because a large change in a company's stock price occurred. On the other hand, Dr. Feinstein's test ignores instances where ARCP filed an 8-K with new and material information that may not have attracted the attention of analysts and, as a result, would not have resulted in a stock price change. Taken together, these effects further bias Dr. Feinstein's results towards finding evidence in favor of market efficiency, as I show below.

41. As discussed above, simply testing whether a higher proportion of 8-K Event Dates have a statistically significant abnormal return than non-8-K Event Dates, as Dr. Feinstein does, is not compelling evidence, as it ignores the proportion of 8-K Event Dates that should be significant in an efficient market. In other words, Dr. Feinstein stacks the deck in his favor through his selection criteria and fails to correspondingly raise the threshold for finding significant evidence of market efficiency.

42. Additionally, Dr. Feinstein failed to identify a number of reports that mentioned ARCP's 8-K filings, improperly excluding such event dates from his analysis. For example, Dr. Feinstein did not include in his analysis the 8-K filed on March 1, 2013, in which ARCP announced that its board of directors approved a $250 million stock repurchase program, even though analysts from Ladenburg Thalmann commented on this 8-K immediately after its filing.[67] As another example, ARCP filed an 8-K on May 20, 2014, in which it provided unaudited pro forma financial information.[68] Analysts from Ladenburg Thalmann discussed a potential error in this 8-K filing.[69] Dr. Feinstein, however, failed to include this 8-K filing in his analysis either. Furthermore, Dr. Feinstein's selection of the 8-K Event Dates did not consider alternative sources for information dissemination, such as "financial blogs, online stock commentary websites (such as *SeekingAlpha*), and other social media platforms," which he identified as "leading disseminators of financial information, supplementing (or in some cases replacing) traditional sell-side equity analyst reports for some investors."[70]

43. Furthermore, Dr. Feinstein's analysis fails to evaluate the direction of ARCP's common stock price movement relative to the news released, despite recognizing that, "[i]n an efficient market, the stock price would rise after unexpected good news and fall after unexpected bad news."[71] In doing so, Dr. Feinstein also ignores Professor Fama's

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67 *See* ARCP Form 8-K, filed on March 1, 2013. *See also* "Transferring Coverage - Raise PT to $15 Post Merger with ARCT III; BUY," Ladenburg Thalmann, March 4, 2013, p. 2.

68 *See* ARCP Form 8-K, filed on May 20, 2014.

69 *See* "Recent Offering Lowers Near-Term Leverage, But Guidance Needs Cutting; NEUTRAL," Ladenburg Thalmann, June 2, 2014, p. 1.

70 Feinstein Report, ¶75.

71 Feinstein Report, ¶160.

acknowledgment that, "there is little doubt that the stock price will increase reasonably promptly after favorable news about a company is released and decline after unfavorable news."[72]

44. For example, Dr. Feinstein includes February 28, 2013 as an event date, which is associated with a statistically significant *negative* abnormal return.[73] On this date, ARCP filed two 8-Ks: one pertaining to quarterly and annual earnings and one pertaining to the completion of the ARCT III acquisition.[74] Two separate analysts favorably discussed both pieces of news.[75] Furthermore, ARCP's quarterly results were on the "high-end of earnings guidance range" and beat analyst consensus estimates for the quarter.[76] One would therefore expect a *positive* abnormal return in ARCP's stock price on this date rather than the *negative* abnormal return that Dr. Feinstein finds.

45. I updated Dr. Feinstein's results using all ARCP 8-Ks filed during the Relevant Class Period to correct for Dr. Feinstein's biased and inconsistently applied selection criteria. I used the same three event study estimation approaches that I described above, but tested all 8-K filing dates, rather than Dr. Feinstein's selected subset of 8-Ks. **Exhibit 3A**,

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72 Feinstein Report, ¶48.

73 *See* Feinstein Report, Exhibit-4 and Exhibit-6.

74 *See* ARCP Forms 8-K filed February 28, 2013.

75 *See* "Transferring Coverage - Raise PT to $15 Post Merger with ARCT III; BUY," Ladenburg Thalmann, March 4, 2013. *See also* "First Look: Maintain MO Following 4Q Earnings and Close of Transformative Merger," JMP Securities, March 1, 2013.

76 *See* ARCP Form 8-K filed February 28, 2013. *See also* consensus estimates obtained from the "ERN" function on Bloomberg.

Exhibit 3B, and **Exhibit 3C** show that there is no evidence that supports a finding of market efficiency for the ARCP common stock during the Pre-Cole Period.[77]

c. Dr. Feinstein's Conclusion Is Not Supported by an Evaluation of ARCP's Common Stock Price Reaction to Earnings Announcements

46. In my opinion, ARCP's earnings announcement dates provide a more relevant and objective set of event dates for assessing whether ARCP's common stock price quickly impounded new and material information. Indeed, Dr. Feinstein discussed stock price reactions to earnings announcements in his recent paper. In this working paper, Dr. Feinstein stated that, "[e]arnings announcements are a reasonable choice for a class of events that can be selected *objectively*."[78] Further, in his paper, Dr. Feinstein evaluated earning announcement dates, rather than earnings surprises, because:

> [E]arnings announcements are often accompanied by revenue results, forward guidance, and management's discussion of other important developments. Thus, the flow of information on earnings announcement dates is generally greater than on more typical days regardless of any potential earnings surprise relative to consensus.[79]

Yet Dr. Feinstein failed to evaluate ARCP's common stock price reaction on earnings announcement dates, despite the allegations involving financial measures that ARCP disclosed on earnings announcements dates.

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[77] In all three exhibits, **Exhibit 3A**, **Exhibit 3B**, and **Exhibit 3C**, I use Dr. Feinstein's own event study methodology and identification of 8-Ks filed during the Relevant Class Period. In **Exhibit 3A**, I rely on the regression results in Exhibit-8b and Exhibit-8c in the Feinstein Report to demonstrate the difference that his event date selection methodology makes, all else equal. In **Exhibit 3B**, I estimate Dr. Feinstein's regression model separately over the Pre-Cole Period and the Post-Cole Period. In **Exhibit 3C**, I estimate Dr. Feinstein's regression model only over the Relevant Class Period and include an indicator variable for the Pre-Cole/Post Cole period as an alternative to separately estimating the regression model over the two periods.

[78] Miguel Villanueva and Steven P. Feinstein, "Stock Price Reactivity to Earnings Announcements: The Role of Cammer/Krogman Factors," March 29, 2019, p. 5 (emphasis added).

[79] Miguel Villanueva and Steven P. Feinstein, "Stock Price Reactivity to Earnings Announcements: The Role of Cammer/Krogman Factors," March 29, 2019, p. 5.

47. In contrast, as I discuss in Section V.B below, Dr. Nye examined ARCP's earnings release dates because "[s]uch earnings-related announcements are an objective set of events to examine, which has been shown in the academic finance literature to impact stock prices."[80]

48. Using Dr. Feinstein's regression analysis, I evaluated the returns of ARCP's common stock price on earnings announcement dates during the Relevant Class Period. I note that, here again, in relying on Dr. Feinstein's methodology, I am not endorsing his specific model. Rather, I am using his regression model to test market efficiency using a more appropriate set of dates.[81] **Exhibit 4** shows that only two of the seven earnings announcement dates during the Relevant Class Period are statistically significant. Furthermore, **Exhibit 4** shows that while ARCP's common stock exhibited a higher proportion of statistically significant abnormal returns on earnings announcement dates than on non-earnings announcement dates, this difference is not statistically significant based on two of the three statistical tests presented. As such, one cannot reliably conclude that ARCP's common stock price reacted more frequently on earnings announcements dates than on non-earnings announcement dates during the Relevant Class Period.

49. Moreover, on at least one of the two earnings announcement dates with a statistically significant abnormal return, ARCP's common stock price reaction was in the *opposite*

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80 Nye Report, ¶48.

81 I note that ARCP's earnings announcement dates typically released information to the market regarding ARCP's Adjusted Funds from Operations ("AFFO"), which I understand Plaintiffs claim is a "measure of operating performance that is critical to analysts and investors in valuing a REIT." Third Amended Class Action Complaint for Violations of the Federal Securities Laws, *In re American Realty Capital Properties, Inc. Litigation*, Civil Action No. 1:15-mc-00040-AKH, filed on September 30, 2016, p. 19.

direction of what would be expected given the information content of the earnings report. As discussed above, ARCP's Q4 2012 results were on the high-end of earnings guidance and beat analyst consensus estimates, yet Dr. Feinstein found a *negative* abnormal return for ARCP's stock price on the trading day following this earnings announcement, February 28, 2013. The fact that Dr. Feinstein found a statistically significant return on an earnings date that is in the opposite of the expected direction undermines a finding of market efficiency.

50. Therefore, these findings do not support Dr. Feinstein's conclusion regarding the efficiency of the market for ARCP's common stock, and raise the question of why he tested ARCP's common stock price reaction on a subset of dates (*i.e.*, the 8-K Event Dates) instead of the earnings announcement dates.

3. ARCP's Common Stock Does Not Pass Empirical Tests for Weak-Form Market Efficiency during the Post-Cole Period

51. In this section, I provide my basis for concluding that there is evidence suggesting that the ARCP common stock did not trade in a weak-form efficient market during the Post-Cole Period, precluding a finding that it traded in a semi-strong efficient market, which is the type of efficiency that the Supreme Court discussed in the *Basic* case I mentioned above.[82]

52. Economists often describe a weak-form efficient market as one where stock prices follow a "random walk."[83] In a "random walk" market, an investor cannot earn a profit based on information about past stock returns because the share price quickly adjusts to this

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[82] *See Basic, Inc. v. Levinson*, 485 U.S. 224, 246-247 (1988).

[83] *See, e.g.*, Eugene F. Fama, "Random Walks in Stock-Market Prices," Selected Papers No. 16, 1965, p. 1.

information such that past returns do not provide any information that investors can use to predict future returns.[84] Weak-form efficiency is a prerequisite for semi-strong efficiency, the type of efficiency at issue in this matter.

53. If stock prices do not follow a "random walk," then an investor could use prior stock returns to develop a trading strategy that beats a buy-and-hold strategy, indicating the market does not exhibit weak-form efficiency. Put differently, if the market for ARCP's common stock was not weak-form efficient during the Post-Cole Period, an investor could have devised a mechanical trading rule (*i.e.*, a "momentum" trading strategy) based on ARCP's common stock's past returns to earn better returns as compared to buying ARCP's common stock and holding it through the end of the period.

54. The academic literature presents sophisticated empirical methods, such as mechanical trading strategies, that financial economists commonly employ to test whether security "prices adjust gradually to new information."[85] Specifically, to investigate the profitability of momentum trading in ARCP's common stock during the Post-Cole Period, I considered whether an investor following what is known as a "y-filter trading strategy" would earn a better return relative to employing a buy-and-hold strategy. If that is the case, *i.e.*, if the y-filter trading strategy does, in fact, provide better returns than simply purchasing ARCP's common stock and holding it, then, as discussed in the academic literature, this presents evidence that ARCP's common stock did not trade in a

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[84] *See, e.g.*, Eugene F. Fama, "Random Walks in Stock-Market Prices," Selected Papers No. 16, 1965, pp. 5-6.

[85] *See, e.g.*, Eugene F. Fama, "Filter Rules and Stock-Market Trading," *The Journal of Business*, Vol. 39, No. 1, 1966, p. 228.

weak-form efficient market.[86] As described by Fama (1970), under a y-filter trading strategy:

> If the price of a security moves up at least y%, buy and hold the security until its price moves down at least y% from a subsequent high, at which time simultaneously sell and go short. The short position is maintained until the price rises at least y% above a subsequent low, at which one covers the short position and buys. Moves less than y% in either direction are ignored.[87]

55. I calculated the profits of a hypothetical ARCP common stock buy-and-hold investor relative to an investor employing 1.0%, 1.5%, 2.0%, 2.5%, 3.0%, and 3.5% "y" filters.[88] As shown in **Exhibit 5**, during the Post-Cole Period, returns for the ARCP common stock investor following the y-filter trading rule strategy exceeded those earned by the hypothetical buy-and-hold investor for all tested "y" filter values. These results suggest that the ARCP common stock did not trade in even a weak-form efficient market during the Post-Cole Period, which would preclude a finding that it traded in a semi-strong efficient market.

4. Dr. Feinstein's Volatility Tests of 8-K Event Dates Are Similarly Flawed

56. Dr. Feinstein's third set of empirical tests purports to examine 8-K Event Dates collectively by comparing the behavior of the ARCP common stock price on the 8-K

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[86] *See, e.g.*, Eugene F. Fama and Marshall E. Blume, "Filter Rules and Stock-Market Trading," *The Journal of Business*, Vol. 39, No. 1, 1966, pp. 226-241.

[87] Eugene Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance*, 1970, pp. 394-395.

[88] Fama (1970) cautions that profits under a y-filter trading rule strategy may be overstated if the analysis does not account for transaction costs. *See* Eugene Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *Journal of Finance*, 1970, p. 396. I assumed that there is a $10 fee associated with each transaction, and that an investor may only sell at the bid price and buy at the ask price (which is conservative because large investors do not always sell at the bid price and buy at the ask price). I further assume an initial investment of 1,000 shares, and that the investor following the y-filter trading rule strategy reinvests any profits.

Event Dates to the behavior of the ARCP common stock price on non-8-K Event Dates.[89] Specifically, Dr. Feinstein asserted that a finding of "greater dispersion [*i.e.*, standard deviation] and larger stock price movements on 8-K event days indicates market efficiency."[90] To analyze the dispersion of ARCP's common stock price, Dr. Feinstein performed an F-test as well as an Ansari-Bradley volatility test for the Original Class Period, Interval-1, and Interval-2 separately.[91] Based on the findings of his tests, Dr. Feinstein concluded that there was a cause-and-effect relationship between the release of new, company-specific information and reactions in the ARCP common stock price.[92] I disagree with Dr. Feinstein for the reasons discussed below.

57. First, Dr. Feinstein does not provide any academic references to support his use of his volatility tests, nor am I aware of any such academic literature. Dr. Feinstein ignores the well-established academic literature that criticizes using volatility tests to assess market efficiency. For example, Fama (1991) recognizes that, "[volatility] tests are not informative about market efficiency."[93] Fama (1991) explains that volatility tests "give no help on the central issue of whether the variation in expected returns is rational" because they do not necessarily explain whether the variation in returns is "related in sensible ways to business conditions."[94] In other words, volatility tests can only demonstrate that there is greater stock price variation for a given sample, but not that this

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89 *See* Feinstein Report, ¶115.

90 Feinstein Report, ¶115.

91 *See* Feinstein Report, ¶¶ 161, 162.

92 Feinstein Report, ¶¶166, 169, 172, 175, 178, 181.

93 Eugene F. Fama, "Efficient Capital Markets: II," *The Journal of Finance*, 1991, pp. 1586.

94 Eugene F. Fama, "Efficient Capital Markets: II," *The Journal of Finance*, 1991, pp. 1586.

variation reflects an efficient price reaction to new information. In addition, Ferrillo et al. (2004) explain that high volatility of stock returns, in excess of what one would expect under the efficient market model, might actually cast doubt on whether stock prices accurately reflect available information.[95]

58. Second, Dr. Feinstein's volatility tests fail to consider the direction of ARCP's common stock price reaction to news released on the 8-K Event Dates. Put differently, Dr. Feinstein's volatility tests cannot differentiate between a positive or negative reaction of ARCP's common stock to a specific news event. For example, Dr. Feinstein's volatility tests would yield the same results if ARCP's common stock price always increased on positive news and declined based on negative news, which would be consistent with market efficiency, or, alternatively, if ARCP's common stock price behaved in the opposite way (*i.e.*, declined with positive news and increased with negative news), which would be ***inconsistent with market efficiency***. Therefore, because Dr. Feinstein's volatility tests fail to assess the direction of the ARCP common stock moves, they do not provide any useful information to answer the question of whether ARCP's common stock traded in "a market in which available information is rapidly incorporated into the price of a security such that the trading price reflects all publicly available information."[96]

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[95] Paul A. Ferrillo, et al., "The 'Less Than' Efficient Capital Markets Hypothesis: Requiring More Proof from Plaintiffs in Fraud-on-the-Market Cases," *St. John's Law Review*, Volume 78, Winter 2004, Number 1, pp. 107, 108. As discussed above, Dr. Feinstein relies on the Ferrillo et al. (2004) article to motivate his collective event study of 8-K Event Dates. *See* Feinstein Report, ¶153.

[96] Feinstein Report, ¶52.

59. Lastly, Dr. Feinstein's volatility tests rely on the same 8-K Event Dates that he uses in his collective event study of 8-K Event Dates and therefore suffer from the same flaws described earlier.

60. In sum, Dr. Feinstein's volatility tests are not grounded in the academic literature and fail to evaluate the magnitude and direction of ARCP's common stock price movements on the 8-K Event Dates. As constructed, these tests would easily misinterpret large stock price movements in the wrong direction as indicative of market efficiency. Dr. Feinstein's volatility tests present no reliable support for his assertion that ARCP's common stock traded in an efficient market during the Relevant Class Period.

B. Dr. Nye's Analyses of the Fifth *Cammer* Factor Are Also Flawed and Fail to Demonstrate Market Efficiency

61. Dr. Nye performed an event study to test whether ARCP's common stock exhibited a statistically significant price change on the three dates during the Relevant Jet Capital Period on which ARCP released quarterly or year-end financial results.[97] Based on his event study, Dr. Nye asserted that "ARCP's stock price reflected the information disclosed to the market, and promptly responded to the disclosure of new, material, unexpected information," and concluded that the market for ARCP's common stock was efficient during the Relevant Jet Capital Period.[98] As I describe below, Dr. Nye's analysis is not sufficient to demonstrate a cause-and-effect relationship between new, material information and ARCP's common stock price during the period from February 27, 2014 through October 28, 2014.

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97 *See* Nye Report, ¶48.

98 Nye Report, ¶51.

1. Dr. Nye's Event Study Does Not Provide Reliable Evidence of Market Efficiency

62. Unlike Dr. Feinstein, who did not even attempt to evaluate ARCP's common stock price reaction on earnings announcement dates, Dr. Nye tested ARCP's common stock price reaction to ARCP's earnings releases on February 27, 2014, May 8, 2014, and July 29, 2014.[99] After controlling for market and industry factors, Dr. Nye found that ARCP's common stock price return was statistically significant at the five percent significance level on February 27, 2014 and at the ten percent significance level on July 29, 2014.[100] Financial economists typically only consider abnormal returns statistically significant if they are significant at the five percent significance level. Therefore, Dr. Nye's event study shows that only February 27, 2014 (*i.e.*, one out of three dates tested) exhibited a statistically significant abnormal return.[101]

63. Dr. Nye posits that because a statistically significant return is expected to occur five percent of the time (given a five percent significance level) "one should expect a random sample of three days to contain 0.15 days with a return that is statistically significant at the 95% confidence level."[102] He then asserts that his event study finds "six times as many statistically significant dates as should be expected from a randomly selected three-day sample"[103] and that his finding "confirms that ARCP's common stock price typically

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99 *See* Nye Report, Exhibit 12.

100 *See* Nye Report, ¶49.

101 *See* Nye Report, Exhibit 11A. Nye Report, ¶49.

102 Nye Report, ¶49.

103 Nye Report, ¶49.

reacted more strongly on event dates than on non-event dates."[104] Dr. Nye's assertion is illogical and scientifically unsound for a number of reasons.

64. First, Dr. Nye's apparent threshold for whether or not ARCP's common stock traded in an efficient market is whether more than a nonsensical 0.15 days of the three earnings release dates is associated with a statistically significant price reaction. A given day can either be associated with a statistically significant price reaction or not (*i.e.*, it is a binary outcome because a day cannot be split into pieces in Dr. Nye's framework). Dr. Nye, however, fails to conduct a statistical test and instead concludes that because one day is simply more than 0.15 days, there is evidence of market efficiency.[105]

65. Second, Dr. Nye purports to evaluate whether he observes more statistically significant abnormal returns than "one should expect a random sample" to contain.[106] Dr. Nye's approach, however, ignores the fact that he selected the three event dates precisely because earnings-related announcements have "been shown in the academic finance literature to impact stock prices."[107] Because these dates are likely associated with the release of material news, one might expect to observe a statistically significant abnormal return on many, perhaps most, of his dates, even if the security is not traded in an efficient market. In other words, although Dr. Nye acknowledges that his analysis should be based upon a "random sample," his selection of event dates does not represent a

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[104] Nye Report, ¶49.

[105] My statistical tests of Dr. Nye's results are described in the paragraphs below.

[106] Nye Report, ¶49.

[107] Nye Report, ¶48.

random sample of dates because he chose the dates most likely to exhibit a stock price reaction.

66. Third, even given these shortcomings, Dr. Nye's event study produces results that do not support a conclusion of market efficiency. A binomial test, which compares Dr. Nye's results to the probability of achieving such results by random chance alone, is a statistical test that can be used to answer Dr. Nye's implied question of whether one should expect a random sample of three days to contain one date associated with a statistically significant abnormal return.[108] In other words, Dr. Nye is incorrect to conclude that the observed number of significant days implies a significant impact of news on price, simply because the proportion of significant days is different from what would be implied under a random five percent chance. In order to make such an assessment, one needs a statistical test that compares Dr. Nye's observed result to the hypothetical result of observing a single significant day by random chance alone. Indeed, as I discuss below, a proper statistical test overturns Dr. Nye's conclusion. ***I note that this question (implied by Dr. Nye) focuses on disproving randomness, not proving a cause-and-effect relationship***.

67. The binomial distribution provides the probability of finding a certain number of successes over *n* trials, where each trial results in one of two possible outcomes (success or failure) and each trial has an equal probability *p* of success.[109] Under Dr. Nye's event study methodology, the number of trials *n* equals three (*i.e.*, the number of earnings announcement dates he tests), and the probability *p* of success (*i.e.*, finding a statistically

[108] *See* Nye Report, ¶49.

[109] *See* Morris H. DeGroot and Mark J. Schervish, "Probability and Statistics," Fourth Edition, 2012, pp. 98-99.

significant abnormal return by random chance alone) equals five percent (based on a five percent significance level). Using this specification of a binomial test, the cumulative probability of finding one or more statistically significant dates due to random chance in a sample of three days is 14.3 percent.[110] In other words, the probability that Dr. Nye's results are due to random chance is far greater than the five percent or less threshold that typically is needed to conclude that a statistically significant cause-and-effect relationship exists between his earnings announcements and ARCP stock returns.

68. Finally, Dr. Nye concluded that "ARCP's common stock price typically reacted more strongly on event dates than on non-event dates" without employing a statistical test that explicitly compared the number of statistically significant dates in these two groups.[111] To address this issue, I used Dr. Nye's event study results and the Z-tests and Fisher's Exact test to determine whether the proportion of earnings announcement dates with statistically significant abnormal returns is higher than that of non-earnings announcement dates. As **Exhibit 4** shows, the proportion of statistically significant abnormal returns on earnings announcement dates was not statistically significantly higher (based on both Fisher's Exact test and the Z-test with unpooled variance) than on non-earnings announcement dates during the Relevant Jet Capital Period. Thus, **Exhibit 4** provides strong evidence against Dr. Nye's conclusion regarding the efficiency of the market for the ARCP common stock.

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[110] The calculated probability should be interpreted as the p-value of the test that the true probability of a significant event is five percent. As such, a high probability translates into a high p-value and implies that the observed number of successes could have been obtained even if there was a five percent random chance to find a significant day, regardless of whether it is truly significant. For the purposes of my analysis, I define five percent as the threshold of random chance, consistent with standard economic practice.

[111] Nye Report, ¶49.

2. ARCP's Common Stock Does Not Pass an Alternative Test for Weak-Form Market Efficiency

69. Dr. Nye tested whether ARCP's common stock returns exhibited serial correlation, noting that the lack of serial correlation may be an indicator of market efficiency.[112] Dr. Nye found that the ARCP common stock did not exhibit statistically significant autocorrelation during the period from February 27, 2014 through October 28, 2014, suggesting that the stock traded in an efficient market.[113] However, the fact that Dr. Nye's test did not find evidence of serial correlation in the returns of ARCP's common stock is not sufficient to conclude that the stock traded in an efficient market.

70. As I discussed earlier, the academic literature presents mechanical trading strategy tests that financial economists commonly employ to test whether security "prices adjust gradually to new information," which is an indication of inefficiency in the market.[114] To investigate the profitability of momentum trading in ARCP's common stock during the Relevant Jet Capital Period, I calculated the profits of a hypothetical ARCP common stock buy-and-hold investor relative to an investor employing the y-filter trading rule strategy.[115] As shown in **Exhibit 5**, returns for the ARCP common stock investor following the y-filter trading rule strategy exceeded those earned by the hypothetical buy-and-hold investor during the Relevant Jet Capital Period. These results suggest that the ARCP common stock did not trade in a weak-form efficient market during the entirety of the Relevant Jet Capital Period.

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[112] *See* Nye Report, ¶56.

[113] *See* Nye Report, ¶56.

[114] *See, e.g.,* Eugene F. Fama and Marshall E. Blume, "Filter Rules and Stock-Market Trading," *The Journal of Business*, Vol. 39, No. 1, p. 228.

[115] *See* Section V.A.3 for detailed discussion of the y-filter trading rule strategy.

VI. DR. FEINSTEIN FAILS TO PROVIDE RELIABLE EVIDENCE THAT THE ARCP NOTES TRADED IN AN EFFICIENT MARKET

71. Dr. Feinstein assessed the market efficiency for the set of ARCP's corporate bonds that were outstanding during the Original Class Period (collectively the "ARCP Notes"), as summarized below:[116]

- *"TAA Notes"*: Senior unsecured, convertible notes issued on July 29, 2013, with an aggregate principal amount of $310 million.[117] The TAA Notes were registered and traded in secondary over-the-counter ("OTC") markets (CUSIP 02917TAA2). The TAA Notes were issued at a price of $99.50 per $100.00 par value, and paid interest semi-annually. On December 10, 2013, ARCP issued a follow-up offering of $287.5 million, for a total aggregate principal amount of $597.5 million.[118]
- *"TAB Notes"*: Senior unsecured, convertible notes issued on December 10, 2013, with an aggregate principal amount of $402.5 million.[119] The TAB Notes were registered and traded in the OTC markets (CUSIP 02917TAB0). The TAB Notes were issued at par value, and paid interest semi-annually.
- *"QAA/QAB Notes"*: On February 6, 2014, ARCP executed a private placement (144A) of $1.3 billion in aggregate principal amount of senior unsecured notes, due for exchange by October 16, 2014 ("QAA Notes"). On September 12, 2014, ARCP issued a prospectus, offering to exchange the QAA Notes for registered, publicly traded notes (CUSIP 03879QAB0) ("QAB Notes").[120]
- *"QAC/QAD Notes"*: On February 6, 2014, ARCP executed a private placement (144A) of $750 million in aggregate principal amount of senior unsecured notes, due for exchange by October 16, 2014 ("QAC Notes"). On September 12, 2014, ARCP issued a prospectus, offering to exchange the QAA Notes for registered, publicly traded notes (CUSIP 03879QAD6) ("QAD Notes").[121]
- *"QAE/QAF Notes"*: On February 6, 2014, ARCP executed a private placement (144A) of $500 million in aggregate principal amount of senior unsecured notes,

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116 *See* Feinstein Report, Appendix-1.

117 *See* ARCP Form 424B5, filed July 25, 2013, pp. S-10, S-26. *See also* ARCP Form 10-K for the year ended December 31, 2013, p. F-18.

118 *See* ARCP Form 424B5, filed December 9, 2013, pp. S-13. *See also* ARCP Form 10-K for the year ended December 31, 2013, p. F-18.

119 *See* ARCP Form 424B5, filed December 6, 2013, pp. S-13. *See also* ARCP Form 10-K for the year ended December 31, 2013, p. F-18.

120 *See* ARCP Form 10-K for the year ended December 31, 2014, p. F-52.

121 *See* ARCP Form 10-K for the year ended December 31, 2014, p. F-52.

due for exchange by October 14, 2014 ("QAE Notes"). On September 12, 2014, ARCP issued a prospectus, offering to exchange the QAA Notes for registered, publicly traded notes (CUSIP 03879QAF1) ("QAF Notes").[122]

72. I refer to the TAA and TAB Notes as the "Convertible Notes," the QAA, QAC, and QAE Notes as the "144A Notes," and the QAB, QAD, and QAF Notes as the "Exchange Notes."

73. Dr. Feinstein's analyses rely on bond trading data (TRACE data) from the Financial Industry Regulatory Authority ("FINRA").[123] As I describe below, Dr. Feinstein failed to properly remove certain trades from the data, causing him to overstate the volume and frequency of trades. Moreover, Dr. Feinstein failed to provide reliable evidence of a cause-and-effect relationship between new, material information and the price reactions of the ARCP Notes.

A. Dr. Feinstein's Organization and Treatment of the TRACE Data Is Incorrect and Incomplete

74. Dr. Feinstein's estimations of trading volume and trading frequency rely on an improper use of the TRACE data. Dr. Feinstein appropriately removed from the TRACE data cancelled trades, reversal trades, and corrected trades.[124] However, Dr. Feinstein failed to remove interdealer trades, agency trades, and trades reported prior to bond issuance, in accordance with the academic literature. I explain below why each of these types of trades should be removed from the TRACE data to arrive at an accurate assessment of trading volume. Moreover, I found several errors in Dr. Feinstein's implementation of

[122] *See* ARCP Form 10-K for the year ended December 31, 2014, p. F-52.

[123] *See* Feinstein Report, ¶¶263, 268.

[124] *See* Feinstein Report, Appendix-3.

his own treatment of the data, and corrected them in my own analysis, as discussed below.[125]

75. The TRACE data contains information self-reported by bond dealers that are FINRA members. Every dealer involved in a given trade must report the trade to FINRA, resulting in duplicative reporting of many trades.[126] For example, in **Table 1** below, I show an excerpt of the TRACE data for the TAB Notes trades on December 11, 2013:

Table 1
TRACE Data for TAB Notes on December 11, 2013

Row	Time	Reporter	Contraparty	Side	Price	Volume	Report Type
1	10:58:22	NMRA	GFIG	Buy	$100.050	$1,000,000	D
2	10:59:53	GFIG	NMRA	Sell	$100.050	$1,000,000	D
3	10:59:53	GFIG	JEFF	Buy	$100.000	$1,000,000	D
4	11:03:55	JEFF	GFIG	Sell	$100.000	$1,000,000	D
5	15:44:11	NMRA	C	Sell	$100.250	$1,000,000	C
6	15:58:39	NMRA	C	Buy	$99.625	$1,000,000	C
7	15:58:43	NMRA	C	Sell	$99.875	$1,000,000	C

76. The TRACE data reports seven trades, each with a volume of $1,000,000. Thus, in Exhibit-15a of his report, Dr. Feinstein reported a total volume of $7,000,000 for the TAB Notes on this day.[127] However, as **Table 1** shows, the trades in rows one and two are clearly the same interdealer trade reported twice. In row one, a dealer, NMRA, reported *buying* $1,000,000 of TAB Notes at a price of $100.05 from another dealer, GFIG, and in row two GFIG reported *selling* the same $1,000,000 of TAB Notes at a price of $100.05 to NMRA. The "report type" of these trades is "D," denoting an

[125] *See also* **Appendix D**, which provides corrected price and volume data from TRACE for the ARCP Notes.

[126] *See* Paul Asquith, et al., "The Effects of Mandatory Transparency in Financial Market Design: Evidence from the Corporate Bond Market," *NBER Working Paper Series*, Working Paper 19417, September 2013, Revised April 2019, p. 9.

[127] *See* Feinstein Report, Exhibit-15a.

interdealer trade between two dealers.[128] Therefore, these two reported trades should be consolidated into a single trade record to avoid double counting.[129] Similarly, the trades reported in rows three and four of **Table 1** are also two sides of the same interdealer trade and should be consolidated into a single trade record to avoid double-counting. Consequently, the total volume on this date equals $5,000,000, rather than the $7,000,000 reported by Dr. Feinstein.

77. The TRACE data also contains trade reports from dealers that acted as an agent between two principals.[130] An agent dealer transfers the bond from one principal to another without assuming any price risk and the TRACE data clearly identifies such trades.[131] Agent trades should similarly be removed from analyses of the TRACE data to avoid double counting.[132] For example, in **Table 2** below, I show an excerpt of the TRACE data for the TAA Notes on June 10, 2014:

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[128] *See* FINRA Data Dictionary, FINRA0000008-013 at 011.

[129] This data treatment is also consistent with the academic literature. *See* the Online Appendix to Paul Asquith, et al., "The Effects of Mandatory Transparency in Financial Market Design: Evidence from the Corporate Bond Market," *NBER Working Paper Series*, Working Paper 19417, September 2013, Revised April 2019. *See also* the supplement to Dick-Nielsen, Jens, "Liquidity Biases in TRACE," *Journal of Fixed Income* 19.2, 2009: 43-55. The Mahanti et al. (2008) paper cited by Dr. Feinstein similarly notes that their sample does *not* include any interdealer trading, which is a less "relevant portion of the trading universe (for the purpose of studying liquidity effects)." *See* Sriketan Mahanti, et al., "Latent Liquidity: A New Measure of Liquidity, with an Application to Corporate Bonds," *Journal of Financial Economics* 88.2, 2008: 272-298, p. 274.

[130] Principals are parties (dealers or customers) that hold the bond and assume the associated risks. Agents are dealers that intermediate between two principals by transferring the bond from one principal to another without assuming any of the associated risks. *See* the Online Appendix to Paul Asquith, et al., "The Effects of Mandatory Transparency in Financial Market Design: Evidence from the Corporate Bond Market," *NBER Working Paper Series*, Working Paper 19417, September 2013, Revised April 2019, p. 5.

[131] The TRACE data contains a "Capacity" field, which indicates the reporter's trading capacity as either principal ("P") or agency ("A"). *See* FINRA Data Dictionary, FINRA0000008-013 at 011.

[132] *See* the Online Appendix to Paul Asquith, et al., "The Effects of Mandatory Transparency in Financial Market Design: Evidence from the Corporate Bond Market," *NBER Working Paper Series*, Working Paper 19417, September 2013, Revised April 2019, p. 5. *See also* the Supplement to Dick-Nielsen, Jens, "Liquidity Biases in TRACE," *Journal of Fixed Income* 19.2, 2009: 43-55.

Table 2
TRACE Data for TAA Notes on June 10, 2014

	Time	Reporter	Contraparty	Side	Price	Volume	Report Type	Capacity
1	10:23:28	NMRA	C	Sell	$102.0000	$20,000	C	P
2	10:38:58	BCAP	C	Buy	$101.5625	$765,000	C	P
3	11:58:00	PWJC	CITI	Sell	$101.0000	$25,000	D	A
4	11:58:15	PWJC	C	Buy	$101.0000	$25,000	C	A
5	12:00:06	CITI	PWJC	Buy	$101.0000	$25,000	D	P
6	14:09:29	BCAP	C	Buy	$101.2500	$1,000	C	P

78. **Table 2** shows that PWJC bought $25,000 of TAA Notes from a customer ("C") at a price of $101 (row four) and sold $25,000 to CITI at the same price of $101 (rows three and five). Thus, PWJC was functioning as an intermediary between CITI and the customer, and PWJC reported to TRACE (in rows three and four) that its "capacity" was "A" (agent) and not "P" (principal). Removing these agency trades reported by PWJC in rows three and four and leaving only the principal trade reported by CITI in row five reduces the total traded volume for TAA Notes on this day by $50,000.

79. There are also several trades in the TRACE data that occurred prior to the issuance of a given ARCP Note. These are likely initial placements associated with the underwriting of the bonds. Consistent with the academic literature, I exclude from the TRACE data trades that occurred prior to the offering date.[133] For example, the TRACE data reports over $135 million of volume for the TAA Notes on July 24, 2013,[134] several days *before* the bond was issued on July 29, 2014.[135]

[133] *See* the Online Appendix to Paul Asquith, et al., "The Effects of Mandatory Transparency in Financial Market Design: Evidence from the Corporate Bond Market," *NBER Working Paper Series*, Working Paper 19417, September 2013, Revised April 2019, p. 9.

[134] *See* Feinstein Report, Exhibit-15a.

[135] ARCP Form 424B5, filed July 25, 2013, pp. S-10, S-26; ARCP Form 10-K for the year ended December 31, 2013, p. F-18.

80. In the following two sections, I show that Dr. Feinstein's failure to properly analyze the TRACE data caused him to overstate his estimates of trading volume and frequency, which are two measures that he cites as supposed evidence that the securities traded in an efficient market during the Relevant Class Period.

B. Dr. Feinstein Overstates Trading Volume in the ARCP Notes

81. As part of his evaluation of the indirect *Cammer* factors for the ARCP Notes, Dr. Feinstein evaluated the trading volume of the ARCP Notes. In particular, using the TRACE data discussed above, Dr. Feinstein calculated the "average weekly turnover" for each of the ARCP Notes and compared this average weekly turnover to "the thresholds applicable to common stock."[136] Dr. Feinstein concluded that eight of the eleven ARCP Notes surpassed the "2% threshold" and the remaining three surpassed the "1% threshold."[137] However, Dr. Feinstein's findings are flawed and overstated due to his incorrect organization and treatment of the TRACE data discussed above, as well as other errors.

82. First, with respect to the Exchange Notes, Dr. Feinstein relied on data from the period *after* October 29, 2014 to evaluate the market efficiency of the Exchange Notes *during* the Original Class Period. In particular, Dr. Feinstein examined data from October 15, 2014 to October 15, 2015, because the exchange process was completed on October 15, 2014.[138] This approach is flawed and an unreliable assessment of the efficiency of the market for these securities during the Relevant Class Period. Even if one were to assume

[136] *See* Feinstein Report, ¶¶263, 264, 265, 266.

[137] *See* Feinstein Report, ¶¶265, 266.

[138] *See* Feinstein Report, ¶¶233, 237.

that the indirect *Cammer* and *Krogman* factors, such as the average weekly volume turnover, can be used to establish market efficiency (which I disagree with), these factors certainly need to be evaluated during the relevant time period.[139] In **Exhibit 6**, I correct this error in Dr. Feinstein's analysis, and analyze the trading volume of the ARCP Notes only during the Relevant Class Period.

83. Second, in **Exhibit 6**, I also correct Dr. Feinstein's failure to remove interdealer trades, agency trades, and trades reported prior to bond issuance from the raw TRACE data. As the exhibit shows, Dr. Feinstein's trading volume estimate is inflated by as much as 33.5 percent. In addition, the exhibit shows that, when the TRACE data is correctly analyzed, only the Convertible Notes surpass the "2% threshold," and the QAA Notes are below the "1% threshold" that Dr. Feinstein identifies.[140] The exhibit further shows that the 144A Notes had a weekly turnover below the "1% threshold" during approximately half of the Relevant Class Period.

84. Finally, I also observe that, while Dr. Feinstein characterizes his flawed estimation of the ARCP Notes' average weekly turnover as "compelling evidence of market efficiency," he writes in his recent academic working paper that "not all [of the indirect *Cammer* and

[139] Dr. Feinstein appears to have conditioned his analysis of the Exchange Notes on the assumption that if "the 144[A] [N]otes traded in an efficient market, it follows that the market for the registered notes would similarly be efficient." *See* Feinstein Report, ¶237. However, the markets for the unregistered 144A Notes and the registered Exchange Notes have different buyer pools. As Dr. Feinstein noted himself, unregistered 144A bonds can only be sold to Qualified Institutional Buyers ("QIBs"), which are institutions that manage at least $100 million in securities for outside investors. QIBs are considered financially sophisticated investors, while the market for registered bonds includes buyers that are not QIBs. It is therefore unclear why Dr. Feinstein conditions the efficiency of the registered bond markets on the efficiency of the QIB market in light of their differences. *See* Feinstein Report, ¶235.

[140] *See* Feinstein Report, ¶¶265, 266.

Krogman] factors are equal," finding in his analysis of stock returns "weaker evidence for volume."[141]

C. Dr. Feinstein's Trading Frequency Analysis Is Misleading and Ignores Evidence that the ARCP Notes Traded Infrequently

85. Dr. Feinstein also calculated the average number of days between successive trades for each of the ARCP Notes, finding that the average number of days "between successive trades ranges between 0.11 and 0.53 days for the ARCP Notes."[142] He compared these trading frequencies to a study by Mahanti et al. (2008), which evaluated a sample of bonds and found that they typically traded every 12 to 22 days.[143] Dr. Feinstein concluded that his findings present "compelling evidence" of market efficiency for the ARCP Notes because the ARCP Notes traded more frequently than the bonds in the Mahanti et al. (2008) study.[144] However, for the reasons discussed below, I do not agree that Dr. Feinstein's misleading comparison with the trading frequencies presented in the Mahanti et al. (2008) study provides "compelling evidence" of market efficiency for the ARCP Notes.

86. First, as with the indirect *Cammer* and *Krogman* factors I discussed above in Section IV, an analysis of a security's trading frequency is not sufficient to demonstrate market efficiency. Frequent trading does not prove the security trades in an efficient market.

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141 *See* Feinstein Report, ¶267. Miguel Villanueva and Steven P. Feinstein, "Stock Price Reactivity to Earnings Announcements: The Role of Cammer/Krogman Factors," March 29, 2019, p. 19.

142 *See* Feinstein Report, ¶270.

143 *See* Sriketan Mahanti, et al., "Latent Liquidity: A New Measure of Liquidity, with an Application to Corporate Bonds," *Journal of Financial Economics* 88 (2008), 272-298, p. 282.

144 *See* Feinstein Report, ¶270, and Exhibit-14.

87. Second, the Mahanti et al. (2008) study Dr. Feinstein cited acknowledged that the U.S. corporate bond market is "one of the most well-known, but illiquid markets in the world."[145] Their sample universe of bonds from 2000 to 2005 was provided by a single custodian (State Street) and exhibited very infrequent trading. Specifically, for each year in their sample, approximately 40 percent of the bonds in the sample did not have any trades, and of the bonds that did have trades, more than half had trades on fewer than ten days, with nearly 80 percent having trades on fewer than 30 days a year.[146] As a result, comparing the ARCP Notes against this, as described by Mahanti et al. (2008), "highly illiquid" sample of securities and pointing out that the ARCP Notes traded more frequently does not provide a basis for Dr. Feinstein's argument that the ARCP Notes traded in an efficient market.

88. In contrast to the highly illiquid sample of bonds they studied, Mahanti et al. (2008) point out that the time between trades for the median *stock* is measured in *minutes*, and that "for the most liquid stocks, this statistic is in *seconds*."[147] Dr. Feinstein calculated a range of 0.11 to 0.53 *days* between consecutive trades for the ARCP Notes, which translates to a range of 158 to 763 *minutes*, or 9,504 to 45,792 *seconds*.[148] Thus, by selectively contrasting the ARCP Notes with a sample of highly illiquid and infrequently

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[145] Sriketan Mahanti, et al., "Latent Liquidity: A New Measure of Liquidity, with an Application to Corporate Bonds," *Journal of Financial Economics* 88 (2008), 272-298, p. 273.

[146] *See* Sriketan Mahanti, et al., "Latent Liquidity: A New Measure of Liquidity, with an Application to Corporate Bonds," *Journal of Financial Economics* 88 (2008), 272-298, p. 279.

[147] *See* Sriketan Mahanti, et al., "Latent Liquidity: A New Measure of Liquidity, with an Application to Corporate Bonds," *Journal of Financial Economics* 88 (2008), 272-298, p. 282.

[148] *See* Feinstein Report, ¶270.

traded bonds, Dr. Feinstein attempts to create the illusion that the ARCP Notes are frequently traded. This comparison provides no basis for Dr. Feinstein's conclusions.

89. Third, a simpler measure of trading frequency, which Dr. Feinstein ignores, is the number of trades per day. **Exhibit 7** shows that, for Convertible Notes and the 144A Notes, the majority of trading days in the Relevant Class Period had five total trades or fewer and many days had no trades at all. In particular, for the 144A Notes, roughly half of the trading days have no trades at all. On average, the number of trades per day for the Convertible Notes and the 144A Notes during the Relevant Class Period ranged from one to five trades. In contrast, a recent paper from the SEC found that even the most illiquid common stocks have over 100 trades per day.[149]

90. Therefore, contrary to Dr. Feinstein's assertion, the trading frequency (or, more appropriately, trading *in*frequency) of ARCP's Notes is not supportive of a finding of market efficiency.

D. Dr. Feinstein Fails to Consider Factors that Limited Transparency in the Market for the ARCP Notes

91. Dr. Feinstein claims that the market for the ARCP Notes was transparent, and points to the introduction of TRACE as a factor that has increased transparency, and thereby efficiency, of the corporate bond market.[150] I disagree with Dr. Feinstein's contention that the transparency of the market for the ARCP Notes supports a finding of market efficiency.

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[149] *See* "Empirical Analysis of Liquidity Demographics and Market Quality for Less Liquid NMS Stocks," *U.S. Securities and Exchange Commission*, April 10, 2018.

[150] *See* Feinstein Report, ¶¶271-277.

92. First, the existence of price transparency alone does not demonstrate an efficient market. While an efficient market will nearly always be transparent, the converse is not true—a transparent market may not be efficient. As with the indirect *Cammer/Krogman* factors discussed above, price transparency is not a sufficient indicator of market efficiency.[151]

93. Second, while the advent of TRACE increased post-trade transparency (*i.e.*, prices of recent transactions), it did not address pre-trade transparency (*i.e.*, prices at which bonds are currently being bid or offered). This lack of pre-trade transparency contrasts with the equities markets, in which stock exchanges disseminate current bid and offer prices and provide investors with continuously updated information about the stock price.[152] For securities like the ARCP Notes, which, as discussed above, trade infrequently and intermittently, the information provided by post-trade transparency may be stale and uninformative.

94. Furthermore, there are other limitations to TRACE's post-trade transparency. FINRA caps the publicly disseminated volume of trades above a certain size and reported trades can be delayed by up to 15 minutes.[153] Additionally, FINRA only began publicly disseminating post-trade information for 144A bonds on June 30, 2014.[154] This means that FINRA publicly disseminated transaction data for ARCP's 144A Notes for less than

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151 *See also, In re: American International Group Securities Litigation*, 265 F.R.D. 157 (NDNY 2010) at 179.

152 In over-the-counter markets such as the ARCP Notes, quotes for bids and offers are typically obtained by contacting a sample of dealers and asking for quotes.

153 *See* "FINRA Brings 144A Corporate Debt Transactions into the Light," *FINRA*, June 30, 2014; 2016 Trace Fact Book, p. 3 available at http://www.finra.org/sites/default/files/2016-trace-fact-book.pdf (accessed May 24, 2019).

154 *See* "FINRA Brings 144A Corporate Debt Transactions into the Light," *FINRA*, June 30, 2014; 2016 Trace Fact Book, p. 3 available at http://www.finra.org/sites/default/files/2016-trace-fact-book.pdf (accessed May 24, 2019).

half of the 144A Notes' trading history. Dr. Feinstein fails to justify his assertion that the market for the 144A Notes was transparent even though their prices were not publicly available for such a large portion of their existence.

E. Dr. Feinstein's Analysis of the Fifth *Cammer* Factor for the ARCP Notes Fails to Demonstrate Market Efficiency

95. Dr. Feinstein performed an event study to test the price reaction of the ARCP Notes to the release of new information on October 29, 2014.[155] Using TRACE data, Dr. Feinstein performed his event study for the Convertible Notes and the 144A Notes during the portion of the Relevant Class Period in which each of these notes traded.[156] For the Exchange Notes, Dr. Feinstein performed his event study for the Exchange Note Estimation Period (*i.e.*, from October 15, 2014 through October 15, 2015) because of limitations in the trading data discussed above.[157] Dr. Feinstein included in his event study only days on which there were trading prices for two consecutive trading days so that he could calculate a one-day yield.[158] Given the large number of days where there are no trades in many of the ARCP Notes, Dr. Feinstein's regression analyses rely on far fewer observations than the number of trading days. For example, **Exhibit 8** shows that, for the QAA bonds, there are 178 trading days during the period Dr. Feinstein analyzed, but only 62 observations in Dr. Feinstein's analysis. In other words, almost two-thirds of trading days are dropped from the analysis because of infrequent trading.

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[155] *See* Feinstein Report, ¶¶278-288. Dr. Feinstein's bond regression model is the same as his common stock regression model, with the sole difference being the addition of a BofA Merrill Lynch "benchmark bond" index, comprised of bonds of comparable coupon, maturity, and credit rating.

[156] *See* Feinstein Report, ¶286.

[157] *See* Feinstein Report, ¶287.

[158] *See* Feinstein Report, ¶287. Dr. Feinstein's event study uses logarithmic returns.

96. Despite these and other limitations of his analyses, Dr. Feinstein concluded that the prices of the ARCP Notes exhibited statistically significant price reactions on October 29, 2014 and concluded that, "this finding proves that the market for ARCP Notes was efficient specifically to the information at issue in this case."[159] However, for the reasons discussed below, Dr. Feinstein's analysis does not provide a reliable basis for his conclusion that the market for ARCP Notes was efficient during the Relevant Class Period.

1. Dr. Feinstein's Test of the Last Day of the Relevant Class Period Is Methodologically Unsound and Incorrectly Includes the 144A Notes

97. The criticisms that I levied against Dr. Feinstein's use of a single-day event study with respect to the ARCP common stock also apply to his event study of this single date for the ARCP Notes. As with the common stock, October 29, 2014 is the date on which ARCP's Notes experienced their largest price decline during the Relevant Class Period.

98. Furthermore, even if one were to accept Dr. Feinstein's event study, his analysis suffers from an error that makes it inapplicable to the 144A Notes (QAA, QAC, and QAE). Specifically, the 144A Notes were all exchanged into the Exchange Notes (QAB, QAD, and QAF) in mid-October 2014 and, thus, ceased to exist prior to October 29, 2014. Therefore, one would not expect to see any transactions in the TRACE data for any the 144A Notes on October 29, 2014.[160] Yet Dr. Feinstein's Exhibit-15b and Exhibit-18

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[159] Feinstein Report, ¶290.

[160] Dr. Feinstein also acknowledged this fact and excluded the QAE Notes from Exhibit-18 ("ARCP Bonds Event Study Results") of his report, in which Dr. Feinstein reported the results of his event study for the "seven notes for which there was sufficient data to conduct the event study on the 29 October 2014 allegation-related disclosure event (TAA, TAB, QAA, QAB, QAC, QAD, and QAF)." *See* Feinstein Report, ¶289, Exhibit-18.

reported prices and abnormal returns for the QAA and QAC notes on October 29, 2014, when such notes no longer traded.

99. My review of the TRACE data shows that the transactions reported for the QAA Notes and the QAC Notes in the TRACE data for October 29, 2014 are actually cancelled trades, as shown in **Table 3** (QAA Notes) and **Table 4** (QAC Notes) below:[161]

Table 3
TRACE Data for QAA Notes on October 29, 2014

	Date	Time	First System ID	Side	Price	Volume	Status
1	10/29/2014	11:29:48	2000024697	Sell	$99.0850	$100,000	T
2	10/29/2014	11:29:48	2000024697	Sell	$99.0850	$100,000	X
3	10/29/2014	11:29:48	2000024700	Buy	$99.0780	$100,000	T
4	10/29/2014	11:29:48	2000024700	Buy	$99.0780	$100,000	X

[161] Row pairs shaded in the same color share the same First System ID, and the second observation of each row pair cancels the first observation. Status = "X" refers to a cancelation of a previously reported trade.

Table 4
TRACE Data for QAC Notes on October 29, 2014

	Date	Time	First System ID	Side	Price	Volume	Status
1	10/29/2014	8:26:50	2000003880	Buy	$99.6000	$5,000,000	T
2	10/29/2014	8:26:50	2000003880	Buy	$99.6000	$5,000,000	X
3	10/29/2014	8:29:02	2000003941	Sell	$99.6320	$2,000,000	T
4	10/29/2014	8:29:02	2000003941	Sell	$99.6320	$2,000,000	X
5	10/29/2014	8:29:42	2000003972	Sell	$99.6320	$3,000,000	T
6	10/29/2014	8:29:42	2000003972	Sell	$99.6320	$3,000,000	X
7	10/29/2014	8:40:13	2000004409	Sell	$98.9590	$2,000,000	T
8	10/29/2014	8:40:13	2000004409	Sell	$98.9590	$2,000,000	X
9	10/29/2014	8:43:16	2000004654	Buy	$98.9590	$2,000,000	T
10	10/29/2014	8:43:16	2000004654	Buy	$98.9590	$2,000,000	X
11	10/29/2014	8:44:42	2000004584	Sell	$98.9590	$2,000,000	T
12	10/29/2014	8:44:42	2000004584	Sell	$98.9590	$2,000,000	X
13	10/29/2014	8:54:20	2000005172	Sell	$99.1360	$2,000,000	T
14	10/29/2014	8:54:20	2000005172	Sell	$99.1360	$2,000,000	X
15	10/29/2014	10:16:06	2000012761	Sell	$98.8340	$1,000,000	T
16	10/29/2014	10:16:06	2000012761	Sell	$98.8340	$1,000,000	X
17	10/29/2014	14:55:35	2000052999	Buy	$97.4780	$2,000,000	T
18	10/29/2014	14:55:35	2000052999	Buy	$97.4780	$2,000,000	X

100. Despite Dr. Feinstein's claim that he properly "eliminated [cancelled] trade[s] from [his] data," he neglected to remove these trades.[162] As a result, Dr. Feinstein's Exhibit-15b and Exhibit-18 report incorrect prices and abnormal returns for October 29, 2014 for the QAA Notes and the QAC Notes, after these notes ceased trading. Dr. Feinstein's one-day event study analysis cannot provide any information with respect to the efficiency of the market for the 144A Notes (QAA, QAC, and QAE) simply because the 144A Notes did not exist on October 29, 2014.

[162] Feinstein Report, Appendix-3.

2. Dr. Feinstein Fails to Test whether the ARCP Notes Exhibited Cause-and-Effect Relationship on Any Day Other than October 29, 2014

101. Dr. Feinstein stated that, "[b]ecause of their senior status, bond values are substantially insulated from all but the most extreme news by a valuation cushion provided by the common and preferred stock."[163] For this reason, Dr. Feinstein opines he did not need to test the 8-K Event Dates (other than October 29, 2014) for the ARCP Notes because the information contained in these 8-Ks might have been of "moderate importance" to ARCP Note investors.[164] Simply ignoring all other potentially value-relevant news days during the Relevant Class Period and focusing on one day, which *ex ante* is known to be an outlier, is not a scientifically rigorous approach. In my opinion, because direct evidence for market efficiency is generally presented through an examination of how a security reacts to new information, it is important to evaluate whether the ARCP Notes responded to other news events during the Relevant Class Period. Therefore, I tested whether the seven ARCP Notes reacted to several types of news events during the Relevant Class Period that Dr. Feinstein neglected—(i) Dr. Feinstein's 8-K Event Dates which were explicitly selected because they were more likely to have value-relevant news, (ii) earnings announcement dates, and (iii) credit rating events issued by bond rating agencies (including Moody's and Standard & Poor's).

102. In **Exhibit 8**, I rely on Dr. Feinstein's regression model for the ARCP Notes and test whether any of the ARCP Notes experienced statistically significant price movements

[163] Feinstein Report, ¶279.

[164] Feinstein Report, ¶280.

more frequently on 8-K Event Dates than on other days.[165] This analysis is similar to the analysis that Dr. Feinstein conducted for the common stock. **Exhibit 8** shows that there is not a statistically significant difference in the proportions of statistically significant abnormal returns on 8-K Event Dates and non-8-K Event Dates during the Relevant Class Period for *any* of the ARCP Notes. In fact, as the results show, the 144A Notes did not exhibit a statistically significant return on any of the 8-K Event Dates.

103. I similarly analyzed the price movements of the ARCP Notes for ARCP's earnings announcement dates and credit event dates. As **Exhibit 9** shows, there were five ARCP earnings announcement dates after the TAA Notes began trading and three earnings announcement dates after the TAB Notes and the 144A Notes began trading. There were also two credit event dates during the Relevant Class Period prior to the issuance of the 144A Notes.[166] As the exhibit shows, there are no statistically significant price movements on *any* of these dates for any the ARCP Notes.

104. Furthermore, when an ARCP Note did exhibit a statistically significant price movement during the Relevant Class Period prior to October 29, 2014, it was *never* on the same date as any of the other ARCP Notes.[167] **Exhibit 10** shows that at least one of the ARCP Notes exhibited a statistically significant price movement on 15 of the trading days

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[165] *See* Feinstein Report, Exhibit-17. As I noted above, in relying on Dr. Feinstein's regression model, I am not endorsing his specific model. Furthermore, my implementation of Dr. Feinstein's regression model uses the corrected treatment of the TRACE data that I described above.

[166] On October 23, 2013, ARCP's credit rating was put on the ratings watch as "Under Review" by Moody's. On January 28, 2014, Moody's maintained a Baa3 rating for ARCP but changed its outlook to "Stable." *See* VEREIT, Inc., Ratings Issuer Outlook, Moody's, available at https://www.moodys.com/credit-ratings/VEREIT-Inc-credit-rating-823613280 (accessed May 24, 2019).

[167] The ARCP Notes were *pari passu*, meaning they were all of equal seniority in ARCP's capital structure and cash flow claims. *See* ARCP Form 424B5, filed July 25, 2013, p. S-28; ARCP Form 424B5, filed December 6, 2013, p. S-32; ARCP Form 8-K, filed on February 7, 2014, at Exhibit 4.2 p. A-2.

during the Relevant Class Period prior to October 29, 2014. However, as **Exhibit 10** also shows, there were no dates on which more than one of the ARCP Notes had a statistically significant price movement. If the ARCP Notes truly responded to news during the Relevant Class Period, one would have expected to observe statistically significant price movements corresponding to the same news and on the same day for more than one of the ARCP Notes.

105. Therefore, while Dr. Feinstein based his claim that the ARCP Notes responded to news on an analysis of just one day at the end of the Relevant Class Period, my analysis of other news days shows that the prices of ARCP Notes did *not* exhibit a cause-and-effect response to company news during the Relevant Class Period.

VII. DR. FEINSTEIN'S EVALUATION OF THE FIFTH *CAMMER* FACTOR FOR ARCP'S PREFERRED STOCK FAILS TO DEMONSTRATE MARKET EFFICIENCY

106. Dr. Feinstein performed an event study to test the price reaction of the ARCP preferred stock to information disclosed on October 29, 2014.[168] Dr. Feinstein's event study found that, after controlling for market and industry effects, ARCP's preferred stock price return on October 29, 2014 was statistically significant at the five percent significance level, and concluded that, "this finding proves that the market for ARCP preferred stock was efficient specifically with respect to the information at issue in this case."[169]

107. As I discussed in prior sections, this approach is flawed and does not provide a reliable basis from which to draw any meaningful conclusions about the efficiency of the market for the ARCP preferred stock during the Relevant Class Period. Dr. Feinstein's test is

[168] *See* Feinstein Report, ¶214.

[169] Feinstein Report, ¶223.

inconsistent with the "scientific method" and biased towards finding a statistically significant abnormal return because it solely tests ARCP's single largest preferred stock price decline during the Relevant Class Period.[170]

108. In addition, Dr. Feinstein asserted that his event study demonstrated that the ARCP preferred stock exhibited a statistically significant relationship with the S&P Preferred Stock Index, which he deemed to be "compelling proof of the efficiency of the market for the ARCP preferred stock."[171] I disagree. I am not aware of any academic literature that recommends using such an approach in the evaluation of market efficiency for a given security. In addition, Hartzmark et al. (2014), an article on which Dr. Feinstein relies in his report, does not mention Dr. Feinstein's approach of testing correlation with a preferred stock index when discussing empirical approaches for assessing the efficiency of the market for preferred stocks.[172] Further, even if one were to accept Dr. Feinstein's methodology, it is unclear how the alleged statistically significant relationship between the ARCP preferred stock and the S&P Preferred Stock Index proves market efficiency for the ARCP preferred stock. In other words, by its design, this approach cannot evaluate whether there was a cause-and-effect relationship between the release of new, company-specific information and changes in the ARCP preferred stock.

109. Finally, although Dr. Feinstein did not test how the preferred stock reacted to 8-K Event Dates,[173] I conducted the same analysis that I described above for the ARCP Notes for

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170 Paul A. Ferrillo, et al., "The 'Less Than' Efficient Capital Markets Hypothesis: Requiring More Proof from Plaintiffs in Fraud-on-the-Market Cases," *St. John's Law Review*, Volume 78, Winter 2004, Number 1, p. 128.

171 Feinstein Report, ¶225.

172 *See* Michael L. Hartzmark, et al., "Understanding the Efficiency of the Market for Preferred Stock," *8 Va. L. & Bus. Rev. 149*, Spring, 2014.

173 *See* Feinstein Report, ¶215.

ARCP's preferred stock. As **Exhibit 8** shows, there is not a statistically significant difference in the proportions of statistically significant abnormal returns on 8-K Event Dates and non-8-K Event Dates during the Relevant Class Period for ARCP's preferred stock. Similarly, there are no statistically significant price movements on any earnings announcement dates or credit rating event dates for the ARCP preferred stock (*see* **Exhibit 9**). Thus, as with the ARCP Notes, there is no evidence that, prior to October 29, 2014, there was a cause-and-effect relationship between news and the price of the ARCP preferred stock, which is required to demonstrate that the securities traded in an efficient market during the Relevant Class Period.

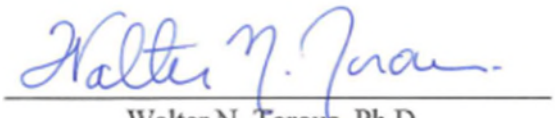
VIII. CONCLUSION

110. In my opinion, the Plaintiffs' experts did not provide reliable evidence supporting the conclusion that the ARCP Securities traded in an efficient market during the relevant periods. With respect to the common stock, Dr. Feinstein ignored earnings dates in his analysis and focused his test of market efficiency on a biased sample of 8-K dates as well as the last day of the Relevant Class Period. He then compared his results for these dates to all other non-news dates. In doing so, he biased his analysis in favor of finding efficiency. Despite the flawed approach, for the Pre-Cole period, his findings do not provide reliable evidence of market efficiency. Dr. Nye uses a more objective approach of selecting earnings dates, but fails to provide an appropriate statistical test of his results. Correcting for this error, his results do not support the conclusion that the ARCP common stock traded in an efficient market during the Relevant Jet Capital Class Period. Moreover, as I presented in my report, there is evidence that during the Post-Cole period,

the ARCP common stock did not exhibit weak form market efficiency, which is a prerequisite for semi-strong market efficiency.

111. With respect to the ARCP Notes and preferred stock, Dr. Feinstein provides no reliable evidence that the securities traded in an efficient market during the Relevant Class Period. His analysis includes mistakes that inflate the trading volume in the ARCP Notes. When corrected, the trading data clearly show that these securities traded infrequently during the Relevant Class Period. Dr. Feinstein also overstates the transparency of these markets during the Relevant Class Period. Most importantly, with respect to both the ARCP Notes and preferred stock, Dr. Feinstein only tests October 29, 2014 in arriving at his conclusion that the markets in which these securities traded were efficient during the Relevant Class Period. Such a biased and flawed approach is not a reliable basis for his conclusion, particularly in light of the evidence that no other news dates during the Relevant Class Period had a causal impact on the price of the securities.

Executed on June 3, 2019



Walter N. Torous, Ph.D.

Appendix A
Curriculum Vitae

WALTER N. TOROUS

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75 Cambridge Parkway, Unit E801
Cambridge, MA, 02142
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Academic Degrees

B. Math.	University of Waterloo, Statistics and Economics, 1976
Ph. D.	University of Pennsylvania, Economics, 1981 Dissertation Title "Differential Taxation and the Equilibrium Structure of Interest Rates" Supervisor: Robert J. Shiller Awarded William Polk Carey Prize for Best Doctoral Dissertation

Academic Appointments

1980-81	Graduate School of Business Administration, University of Michigan, Lecturer
1981-85	Graduate School of Business Administration, University of Michigan, Assistant Professor
1986-87	Graduate School of Management, University of California, Los Angeles, Visiting Assistant Professor
1987-90	Graduate School of Management, University of California, Los Angeles, Assistant Professor
1990-95	John E. Anderson Graduate School of Management, University of California, Los Angeles, Associate Professor

1995-97 London Business School, Corporation of London Professor of Finance

1995-2006 John E. Anderson Graduate School of Management, University of California, Los Angeles, Professor

1997-2003 Director, Richard S. Ziman Real Estate Center, John E. Anderson Graduate School of Management, University of California, Los Angeles

2006-2012 John E. Anderson Graduate School of Management, University of California, Los Angeles, Lee and Seymour Graff Endowed Professor

2009-2011 Visiting Professor
Center for Real Estate
Massachusetts Institute of Technology, Cambridge, MA

2012- Senior Lecturer
Center for Real Estate / Sloan School of Management
Massachusetts Institute of Technology, Cambridge, MA

Professional Activities

Journal of Housing Economics, Associate Editor, 1991 -
Journal of Real Estate Finance and Economics, Associate Editor, 1992 -
Real Estate Economics,
Associate Editor, 1993 - 2005, 2015 -
Editor, 2006 - 2014
Pacific-Basin Finance Journal, Associate Editor, 1997- 2003
Economic Notes, Associate Editor, 1999 - 2011

Ad hoc referee for Journal of Finance, Journal of Financial and Quantitative Analysis, Journal of Banking and Finance, Journal of Business, Review of Financial Studies, Journal of Financial Economics, Journal of Money, Credit, and Banking, Management Science, Journal of Empirical Finance, Journal of International Money and Finance

Member:
American Finance Association, 1980 -
American Real Estate and Urban Economics Association, 1990 -
Western Finance Association, 1980 -
Associate Program Chair, 1990
Board of Directors, 1991-94

Refereed Publications

1. Ball, C. A., and Torous, W. N., "A Simplified Jump Process for Common Stock Returns," Journal of Financial and Quantitative Analysis, 18:1, pp. 53-65, March 1983.

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48. Bokhari, S., Torous, W. N., and Wheaton, W., “Leverage in the Housing Boom and Bust”, 2015.

49. Boudry, W., Liu, C., Mulhofer, T., and Torous, W.N., “Using Cash Flow Dynamics to Price Thinly Traded Assets”, 2017.

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Appendix B

WALTER N. TOROUS

List of Testimony in the Last Four Years

2018 – *Residential Funding Company, LLC v. Home Loan Center, Inc.*, In the United States District Court for the District of Minnesota, Case No. 14-cv-01716 (SRN/HB)
Provided expert report and deposition testimony.

2018 – *Residential Funding Company, LLC v. Decision One Mortgage Company, LLC*, In the United States District Court for the District of Minnesota, Case No. 14-cv-1737 (MJD/JSM)
Provided expert report and deposition testimony.

2018 – *Residential Funding Company, LLC v. HSBC Mortgage Corp. (USA)*, In the United States Bankruptcy Court for the Southern District of New York, Case No. 14-01915 (MG)
Provided expert report and deposition testimony.

2018 – *Federal Deposit Insurance Corporation as Receiver for Guaranty Bank v. Deutsche Bank Securities Inc., et al.,* In the United States District Court for the Western District of Texas Austin Division, Case No. 1:14-cv-00129-SS
Provided expert report and deposition testimony.

2018 – *Federal Deposit Insurance Corporation as Receiver for Guaranty Bank v. RBS Securities Inc., et al.*, In the United States District Court for the Western District of Texas Austin Division, Case No. 1:14-cv-00126-SS
Provided expert report and deposition testimony.

2017 – *Ramon Moreno, et al. v. Deutsche Bank Americas Holding Corp., et al.*, In the United States District Court for the Southern District of New York, Case No. 1:15-cv-09936 (LGS)
Provided expert report and deposition testimony.

2017 – *Lou Baker, et al. v. SeaWorld Entertainment, Inc., et al.*, In the United States District Court for the Southern District of California, Case No. 3:14-cv-02129-MMA-AGS
Provided expert report and deposition testimony.

2017 – *Old Republic Insurance Company and Old Republic Insured Credit Services, Inc., n/k/a Republic Insured Credit Services, Inc. v. The Bank of New York Mellon, BNY Mellon Trust of Delaware, Countrywide Bank, FSB, n/k/a Bank of America, N.A., Countrywide Home Loans Servicing, LP, n/k/a Bank of America, N.A.; Countrywide Bank, FSB, n/k/a Bank of America, N.A., Countrywide Home Loans, Inc., Countrywide Home Loans Servicing, LP, n/k/a Bank of America, N.A., The Bank of New York Mellon, and BNY Mellon Trust of Delaware v. Old Republic Insurance Company;* In the Circuit Court of

Cook County, Illinois for the County Department, Chancery Division, Case No. 08 CH 47501
Provided expert report and deposition testimony.

2017 – *Royal Park Investments SA/NV v. HSBC Bank USA, National Association*, In the United STATES District Court for the Southern District of New York, Case No. 14-cv-8175-LGS-SN; *BlackRock Balanced Capital Portfolio (FI), et al. v. HSBC Bank USA, National Association*, In the United States District Court for the Southern District of New York, Case No. 14-cv-9366-LGS-SN
Provided expert report and deposition testimony.

2017 – *U.S. Bank National Association, solely in its capacity as Trustee for Citigroup Mortgage Loan Trust 2007-AR7 v. Citigroup Global Markets Realty Corp. and CitiMortgage, Inc.*, In the United States District Court for the Southern District of New York, Civil Action No. 13 Civ. 6989 (GBD)
Provided expert report and deposition testimony.

2016 – *U.S. Bank National Association, solely in its capacity as Trustee of the Home Equity Asset Trust 2007-1 (HEAT 2007-1) v. DLJ Mortgage Capital, Inc.*, In the Supreme Court of the State of New York County of New York, Index No. 650369/2013
Provided expert report and deposition testimony.

2016 – *Federal Deposit Insurance Corporation v. Credit Suisse First Boston Mortgage Securities Corp., et al.*, In the Circuit Court of Montgomery County, Alabama, Civil Action No. 03-cv-2012-901035.00 and *Federal Deposit Insurance Corporation v. RBS Securities Inc.*, In the Circuit Court of Montgomery County, Alabama, Civil Action No. 03-cv-2012-901036.00
Provided expert report and deposition testimony.

2016 – *Home Equity Mortgage Trust Series 2006-1, et al. v. DLJ Mortgage Capital, Inc. and Select Portfolio Servicing, Inc.*, In the Supreme Court of the State of New York, County of New York, Index No. 156016; *Home Equity Mortgage Trust Series 2006-5, by U.S. Bank National Association, solely in its capacity as Trustee v. DLJ Mortgage Capital, Inc. and Select Portfolio Servicing, Inc.*, In the Supreme Court of the State of New York, County of New York, Index No. 653787
Provided expert report and deposition testimony.

2016 – *Federal Deposit Insurance Corporation v. RBS Securities Inc.*, In the Circuit Court of Montgomery County, Alabama, Civil Action No. 03-cv-2012-901036.00
Provided expert report and deposition testimony.

2016 – *National Credit Union Administration Board v. RBS Securities Inc., et al.*, In the United States District Court for the Central District of California, Case No. 11-cv-5887 GW (JEM)
Provided expert report and deposition testimony.

2016 – *National Credit Union Administration Board v. RBS Securities Inc., et al.*, In the United States District Court for the District of Kansas, Case No. 11-cv-2340 JWL (JPO)
Provided expert report and deposition testimony.

2016 – *Federal Home Loan Bank of San Francisco v. Deutsche Bank Securities Inc., et al.,* In the Superior Court of the State of California and for the City and County of San Francisco, Case No. CGC-10-497839
Provided expert report and deposition testimony.

2016 – *Federal Housing Finance Agency v. The Royal Bank of Scotland Group PLC, et al.,* In the United States District Court of Connecticut, Case No. 3:11-cv-01383 (AWT)
Provided expert report and deposition testimony.

2015 – *Deutsche Bank National Trust Company, as Trustee for Morgan Stanley ABS Capital I Inc. Trust 2007-HE6 v. Decision One Mortgage Company, LLC*, In the Circuit Court of Cook County, Illinois County Department – Law Division, Case No. 2013 L 005823
Provided expert report and deposition testimony.

2015 – *New Jersey Carpenters Health Fund, on Behalf of Itself and All Others Similarly Situated v. Novastar Mortgage, Inc., et al.*, In the United States District Court for the Southern District of New York, Case No. 08-cv-5310 (DAB)
Provided expert report and deposition testimony.

2015 – *In Re MF Global Holdings Limited Securities Litigation*, In the United States District Court Southern District of New York, Case No. 1:11-cv-07866-VM
Provided expert report and deposition testimony.

2015 – *Federal Home Loan Bank of Seattle, a bank created by federal law v. Deutsche Bank Securities Inc., a Delaware corporation; Deutsche Alt-A Securities, Inc., a Delaware corporation; and DB Structured Products, Inc., a Delaware corporation*, In the Superior Court of Washington for King County, Case No. 09-2-46351-4 SEA
Provided expert report and deposition testimony.

2015 – *Federal Home Loan Bank of Seattle, a bank created by federal law v. RBS Securities Inc., f/k/a/ Greenwich Capital Markets, Inc., a Delaware Corporation; Greenwich Capital Acceptance, Inc., a Delaware Corporation; and RBS Holdings USA, Inc., f/k/a Greenwich Capital Holdings, Inc., a Delaware Corporation*, In the Superior Court of Washington for King County, Case No. 09-2-46347-6
Provided expert report and deposition testimony.

2015 – *Fort Worth Employees' Retirement Fund, On Behalf of Itself and All Others Similarly Situated v. J.P. Morgan Chase & Co., et al.*, In the United States District Court for the Southern District of New York, Case No. 1:09-cv-03701 (JPO)
Provided expert report and deposition testimony.

Appendix C
Materials Relied Upon

Expert Reports and Depositions

Expert Report of Zachary Nye, Ph.D., *Jet Capital Master Fund, L.P. et al. v. American Realty Capital Properties, Inc. et al.* , No. 1:15-cv-00307-AKH, March 15, 2019.

Report on Market Efficiency of Professor Steven P. Feinstein, Ph.D., CFA, *In re American Realty Capital Properties, Inc. Litigation* , Civil Action No. 1:15-mc-00040-AKH, March 15, 2017.

Expert Report of Christopher M. James, Ph.D., *In Re American Realty Capital Properties, Inc. Litigation,* Civil Action No.: 1:15-mc-00040-AKH, May 5, 2017.

Deposition of Steven P. Feinstein, June 15, 2017.

Deposition of Christopher James, August 1, 2017.

Case Documents

Third Amended Class Action Complaint for Violations of the Federal Securities Laws, *In re American Realty Capital Properties, Inc. Litigation* , Civil Action No. 1:15-mc-00040-AKH, filed on September 30, 2016.

Feinstein Exhibit Stack (SF0033381).xlsx

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"Returns Fueled by COLE; Upgrade to Outperform," BMO Capital Markets, October 24, 2013.

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Andrei Shleifer and Robert W. Vishny, "The Limits of Arbitrage," *The Journal of Finance* , Vol. 52, No. 1, March 1997.

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Eugene F. Fama and Marshall E. Blume, "Filter Rules and Stock-Market Trading," *The Journal of Business* , Vol. 39, No. 1, (1966).

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Michael L. Hartzmark, et al., "Understanding the Efficiency of the Market for Preferred Stock," *8 Va. L. & Bus. Rev. 149* , Spring, 2014.

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Morris H. DeGroot and Mark J. Schervish, "Probability and Statistics," Fourth Edition, 2012.

Mukesh Bajaj et al., "Assessing Market Efficiency for Reliance on the Fraud-on-the-Market Doctrine after *Wal-Mart* and *Amgen* ," *Research in Law and Economics* , Vol. 26 (2014).

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Court Opinions

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Appendix D-1
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Convertible Notes
July 29, 2013 to October 15, 2015

	TAA Notes			TAB Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
7/29/2013	5,895,000	$99.84				
7/30/2013	1,055,000	$99.63	-0.21%			
7/31/2013	3,000,000	$99.16	-0.48%			
8/1/2013	1,210,000	$99.22	0.06%			
8/2/2013	2,112,000	$98.08	-1.15%			
8/5/2013	2,400,000	$98.23	0.15%			
8/6/2013	4,850,000	$98.18	-0.06%			
8/7/2013	3,000,000	$97.50	-0.69%			
8/8/2013	1,017,000	$97.18	-0.33%			
8/9/2013	1,181,000	$98.09	0.93%			
8/12/2013	307,000	$97.65	-0.45%			
8/13/2013	4,000,000	$96.95	-0.72%			
8/14/2013	630,000	$97.25	0.31%			
8/15/2013	7,777,000	$96.32	-0.96%			
8/16/2013	3,750,000	$95.85	-0.49%			
8/19/2013	4,100,000	$95.29	-0.58%			
8/20/2013	2,500,000	$95.38	0.10%			
8/21/2013	4,742,000	$95.54	0.17%			
8/22/2013	0					
8/23/2013	624,000	$96.03				
8/26/2013	2,132,000	$95.96	-0.07%			
8/27/2013	0					
8/28/2013	4,866,000	$96.03				
8/29/2013	1,000,000	$96.69	0.69%			
8/30/2013	0					
9/3/2013	2,000,000	$95.68				
9/4/2013	3,364,000	$95.42	-0.27%			
9/5/2013	3,000,000	$94.97	-0.47%			
9/6/2013	0					
9/9/2013	200,000	$94.50				
9/10/2013	199,000	$95.18	0.72%			
9/11/2013	1,810,000	$94.78	-0.43%			
9/12/2013	6,100,000	$94.78	0.00%			
9/13/2013	1,245,000	$95.32	0.57%			
9/16/2013	3,822,000	$95.08	-0.26%			
9/17/2013	535,000	$95.63	0.58%			
9/18/2013	1,000,000	$95.70	0.08%			
9/19/2013	0					
9/20/2013	3,000,000	$95.41				
9/23/2013	5,300,000	$95.64	0.24%			
9/24/2013	145,000	$95.38	-0.28%			
9/25/2013	3,435,000	$95.55	0.18%			
9/26/2013	1,000,000	$95.03	-0.54%			
9/27/2013	3,315,000	$95.08	0.05%			
9/30/2013	0					
10/1/2013	0					
10/2/2013	2,000,000	$96.19				
10/3/2013	640,000	$96.38	0.19%			
10/4/2013	0					
10/7/2013	5,445,000	$96.32				
10/8/2013	1,490,000	$96.07	-0.25%			
10/9/2013	1,000,000	$95.28	-0.83%			
10/10/2013	5,150,000	$95.70	0.43%			
10/11/2013	220,000	$95.78	0.08%			
10/14/2013	10,500,000	$96.90	1.17%			
10/15/2013	54,560,000	$99.80	2.95%			
10/16/2013	23,000,000	$100.76	0.96%			
10/17/2013	9,670,000	$101.38	0.61%			
10/18/2013	15,495,000	$101.93	0.54%			
10/21/2013	5,000	$101.75	-0.18%			

Appendix D-1
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Convertible Notes
July 29, 2013 to October 15, 2015

	TAA Notes			TAB Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
10/22/2013	6,000,000	$102.17	0.41%			
10/23/2013	29,423,000	$101.68	-0.49%			
10/24/2013	7,040,000	$102.06	0.38%			
10/25/2013	5,500,000	$102.35	0.28%			
10/28/2013	6,710,000	$102.52	0.17%			
10/29/2013	1,316,000	$102.76	0.23%			
10/30/2013	3,170,000	$102.36	-0.38%			
10/31/2013	7,530,000	$101.74	-0.61%			
11/1/2013	105,000	$102.13	0.37%			
11/4/2013	0					
11/5/2013	0					
11/6/2013	3,162,000	$101.31				
11/7/2013	3,020,000	$101.29	-0.02%			
11/8/2013	0					
11/11/2013	0					
11/12/2013	3,165,000	$100.55				
11/13/2013	2,082,000	$101.19	0.63%			
11/14/2013	1,000,000	$101.38	0.19%			
11/15/2013	3,192,000	$101.42	0.04%			
11/18/2013	200,000	$101.63	0.20%			
11/19/2013	2,187,000	$101.04	-0.58%			
11/20/2013	0					
11/21/2013	1,000,000	$101.00				
11/22/2013	688,000	$101.03	0.03%			
11/25/2013	2,112,000	$101.31	0.27%			
11/26/2013	12,000	$100.88	-0.43%			
11/27/2013	1,800,000	$101.58	0.70%			
11/29/2013	0					
12/2/2013	7,795,000	$102.02				
12/3/2013	1,000,000	$102.14	0.12%			
12/4/2013	1,000,000	$100.50	-1.62%			
12/5/2013	90,000,000	$100.01	-0.49%			
12/6/2013	17,000,000	$99.86	-0.15%			
12/9/2013	3,000,000	$99.98	0.12%			
12/10/2013	2,000,000	$99.84	-0.14%	3,000,000	$100.41	
12/11/2013	4,000,000	$99.51	-0.33%	5,000,000	$99.96	-0.45%
12/12/2013	3,000,000	$99.08	-0.43%	2,120,000	$99.63	-0.33%
12/13/2013	2,000,000	$99.05	-0.03%	1,000,000	$100.44	0.80%
12/16/2013	6,000,000	$99.52	0.47%	1,000,000	$100.77	0.33%
12/17/2013	2,000,000	$99.70	0.18%	1,000,000	$100.65	-0.12%
12/18/2013	847,000	$99.84	0.14%	1,000,000	$100.88	0.22%
12/19/2013	3,000,000	$99.73	-0.12%	0		
12/20/2013	3,000,000	$99.47	-0.26%	2,000,000	$100.73	
12/23/2013	14,000	$99.38	-0.09%	0		
12/24/2013	0			1,000,000	$100.88	
12/26/2013	0			95,000	$101.50	0.62%
12/27/2013	1,020,000	$100.32		400,000	$101.75	0.25%
12/30/2013	0			1,000,000	$101.75	0.00%
12/31/2013	0			0		
1/2/2014	5,075,000	$100.28		4,075,000	$101.68	
1/3/2014	1,040,000	$100.38	0.10%	2,000,000	$101.84	0.15%
1/6/2014	1,000,000	$100.50	0.11%	0		
1/7/2014	9,205,000	$100.45	-0.05%	1,363,000	$101.81	
1/8/2014	7,000,000	$100.29	-0.16%	10,525,000	$101.67	-0.14%
1/9/2014	7,000,000	$100.43	0.13%	12,480,000	$101.76	0.09%
1/10/2014	8,000,000	$101.06	0.63%	3,053,000	$102.49	0.71%
1/13/2014	7,000,000	$101.19	0.12%	10,785,000	$103.29	0.78%
1/14/2014	6,000,000	$101.26	0.08%	728,000	$103.67	0.37%
1/15/2014	16,500,000	$101.66	0.39%	9,862,000	$104.58	0.87%
1/16/2014	10,460,000	$102.02	0.35%	8,000,000	$105.50	0.87%

Appendix D-1
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Convertible Notes
July 29, 2013 to October 15, 2015

	TAA Notes			TAB Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
1/17/2014	8,525,000	$102.06	0.04%	2,423,000	$105.74	0.23%
1/21/2014	8,000,000	$102.74	0.67%	8,000,000	$106.41	0.63%
1/22/2014	5,575,000	$103.14	0.39%	30,000	$104.68	-1.63%
1/23/2014	525,000	$103.65	0.49%	7,000,000	$107.34	2.51%
1/24/2014	1,005,000	$103.04	-0.59%	1,023,000	$106.76	-0.55%
1/27/2014	2,070,000	$103.06	0.02%	75,000	$106.50	-0.24%
1/28/2014	2,770,000	$103.05	-0.01%	0		
1/29/2014	5,650,000	$103.01	-0.03%	100,000	$106.00	
1/30/2014	3,045,000	$103.05	0.04%	8,017,000	$106.85	0.80%
1/31/2014	4,605,000	$102.84	-0.21%	2,020,000	$106.38	-0.44%
2/3/2014	1,000,000	$102.29	-0.53%	500,000	$105.75	-0.60%
2/4/2014	14,110,000	$102.96	0.65%	3,290,000	$106.30	0.52%
2/5/2014	4,302,000	$103.44	0.46%	2,024,000	$106.76	0.44%
2/6/2014	5,100,000	$103.77	0.32%	7,630,000	$107.26	0.46%
2/7/2014	0			2,200,000	$107.32	0.06%
2/10/2014	5,020,000	$104.08		340,000	$107.00	-0.30%
2/11/2014	10,500,000	$104.30	0.21%	7,000,000	$107.62	0.58%
2/12/2014	6,690,000	$103.92	-0.36%	6,273,000	$107.31	-0.29%
2/13/2014	9,009,000	$104.43	0.49%	4,000	$107.25	-0.05%
2/14/2014	13,000,000	$104.50	0.07%	7,200,000	$108.48	1.14%
2/18/2014	4,000,000	$105.08	0.56%	0		
2/19/2014	6,870,000	$105.56	0.45%	8,645,000	$109.44	
2/20/2014	9,780,000	$105.75	0.18%	10,000,000	$109.08	-0.33%
2/21/2014	7,523,000	$105.89	0.13%	16,000	$108.75	-0.30%
2/24/2014	4,000,000	$106.22	0.31%	0		
2/25/2014	12,000,000	$106.70	0.45%	6,000,000	$109.98	
2/26/2014	1,000,000	$107.25	0.51%	8,018,000	$110.12	0.13%
2/27/2014	2,428,000	$107.79	0.50%	10,250,000	$111.13	0.91%
2/28/2014	8,500,000	$108.70	0.84%	17,250,000	$111.77	0.58%
3/3/2014	7,812,000	$108.74	0.04%	1,927,000	$111.65	-0.10%
3/4/2014	12,684,000	$109.26	0.48%	2,370,000	$112.38	0.65%
3/5/2014	7,070,000	$109.33	0.06%	3,000,000	$112.03	-0.31%
3/6/2014	1,298,000	$109.06	-0.25%	107,000	$112.13	0.09%
3/7/2014	2,168,000	$108.71	-0.32%	157,000	$111.00	-1.01%
3/10/2014	2,010,000	$108.28	-0.40%	1,525,000	$111.57	0.52%
3/11/2014	3,000,000	$108.57	0.27%	150,000	$112.00	0.38%
3/12/2014	1,831,000	$108.17	-0.37%	0		
3/13/2014	4,003,000	$109.05	0.81%	1,000,000	$111.79	
3/14/2014	1,000,000	$108.63	-0.39%	200,000	$111.63	-0.14%
3/17/2014	2,410,000	$107.97	-0.61%	3,260,000	$110.80	-0.74%
3/18/2014	2,137,000	$107.82	-0.14%	2,000,000	$110.63	-0.16%
3/19/2014	3,896,000	$107.20	-0.57%	1,200,000	$109.66	-0.87%
3/20/2014	830,000	$106.58	-0.58%	1,023,000	$108.86	-0.74%
3/21/2014	1,214,000	$106.77	0.18%	2,380,000	$109.06	0.19%
3/24/2014	1,000,000	$106.39	-0.36%	0		
3/25/2014	1,074,000	$106.66	0.25%	550,000	$108.27	
3/26/2014	0			300,000	$109.13	0.79%
3/27/2014	2,154,000	$105.87		2,006,000	$108.50	-0.58%
3/28/2014	1,000,000	$106.00	0.12%	0		
3/31/2014	0			1,940,000	$108.65	
4/1/2014	143,000	$105.89		1,000,000	$109.44	0.73%
4/2/2014	5,732,000	$105.97	0.08%	3,001,000	$108.73	-0.65%
4/3/2014	1,023,000	$105.87	-0.09%	2,116,000	$108.10	-0.58%
4/4/2014	4,082,000	$105.74	-0.13%	500,000	$108.16	0.06%
4/7/2014	0			2,079,000	$108.35	0.17%
4/8/2014	1,589,000	$105.60		8,000,000	$107.96	-0.36%
4/9/2014	1,119,000	$104.95	-0.62%	2,245,000	$107.19	-0.72%
4/10/2014	167,000	$105.25	0.29%	1,000,000	$107.13	-0.06%
4/11/2014	400,000	$104.75	-0.48%	1,000,000	$106.83	-0.27%
4/14/2014	0			93,000	$106.66	-0.16%

Appendix D-1
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Convertible Notes
July 29, 2013 to October 15, 2015

	TAA Notes			TAB Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
4/15/2014	4,207,000	$104.58		1,189,000	$106.60	-0.06%
4/16/2014	13,732,000	$104.65	0.07%	5,790,000	$107.08	0.45%
4/17/2014	2,009,000	$104.42	-0.23%	1,000,000	$107.05	-0.03%
4/21/2014	2,000,000	$104.06	-0.34%	0		
4/22/2014	4,250,000	$104.59	0.51%	4,275,000	$107.15	
4/23/2014	2,020,000	$104.43	-0.16%	3,235,000	$107.39	0.22%
4/24/2014	7,120,000	$104.25	-0.17%	5,005,000	$107.06	-0.31%
4/25/2014	3,235,000	$103.79	-0.44%	1,000,000	$106.23	-0.78%
4/28/2014	7,000,000	$103.24	-0.54%	7,000,000	$105.67	-0.53%
4/29/2014	6,000,000	$103.44	0.20%	4,634,000	$106.08	0.39%
4/30/2014	700,000	$103.57	0.12%	1,500,000	$106.34	0.25%
5/1/2014	5,086,000	$103.69	0.11%	7,561,000	$106.24	-0.10%
5/2/2014	1,000,000	$103.53	-0.15%	0		
5/5/2014	2,000,000	$103.51	-0.02%	1,000,000	$105.94	
5/6/2014	9,000,000	$103.11	-0.39%	3,000,000	$105.71	-0.22%
5/7/2014	3,000,000	$103.10	-0.01%	3,000,000	$105.25	-0.43%
5/8/2014	9,000,000	$102.81	-0.28%	4,070,000	$105.14	-0.10%
5/9/2014	2,155,000	$103.26	0.44%	1,590,000	$105.98	0.80%
5/12/2014	0			40,000	$107.00	0.95%
5/13/2014	3,070,000	$103.83		2,295,000	$106.79	-0.20%
5/14/2014	4,804,000	$103.84	0.01%	1,700,000	$106.70	-0.09%
5/15/2014	2,015,000	$103.61	-0.22%	2,500,000	$106.36	-0.32%
5/16/2014	1,106,000	$103.65	0.04%	0		
5/19/2014	50,000	$103.75	0.10%	3,500,000	$105.32	
5/20/2014	6,509,000	$103.42	-0.32%	1,000,000	$105.50	0.17%
5/21/2014	21,032,000	$103.12	-0.29%	13,040,000	$104.72	-0.74%
5/22/2014	12,000,000	$103.16	0.04%	10,000,000	$104.95	0.23%
5/23/2014	6,038,000	$103.24	0.07%	3,500,000	$104.99	0.04%
5/27/2014	451,000	$103.17	-0.07%	350,000	$105.08	0.08%
5/28/2014	4,047,000	$103.47	0.29%	55,000	$105.01	-0.07%
5/29/2014	2,499,000	$103.05	-0.40%	2,090,000	$104.83	-0.17%
5/30/2014	3,375,000	$103.00	-0.05%	2,472,000	$104.63	-0.19%
6/2/2014	2,130,000	$103.06	0.06%	0		
6/3/2014	5,654,000	$103.13	0.06%	300,000	$105.13	
6/4/2014	5,470,000	$102.88	-0.23%	4,565,000	$105.27	0.14%
6/5/2014	2,000,000	$102.31	-0.56%	34,000	$104.75	-0.49%
6/6/2014	5,000,000	$102.08	-0.23%	294,000	$104.70	-0.05%
6/9/2014	1,210,000	$102.11	0.03%	2,000,000	$104.49	-0.20%
6/10/2014	811,000	$101.56	-0.54%	246,000	$104.47	-0.01%
6/11/2014	6,400,000	$101.32	-0.23%	4,124,000	$103.35	-1.08%
6/12/2014	7,079,000	$101.48	0.16%	1,000,000	$103.40	0.05%
6/13/2014	2,500,000	$101.56	0.08%	2,000,000	$103.47	0.07%
6/16/2014	173,000	$101.77	0.21%	0		
6/17/2014	2,162,000	$101.61	-0.16%	3,456,000	$103.66	
6/18/2014	4,750,000	$101.52	-0.09%	4,061,000	$103.69	0.03%
6/19/2014	1,300,000	$101.28	-0.24%	7,000	$102.25	-1.40%
6/20/2014	2,212,000	$101.97	0.68%	2,008,000	$104.54	2.21%
6/23/2014	500,000	$102.13	0.15%	4,016,000	$104.70	0.16%
6/24/2014	150,000	$102.25	0.12%	650,000	$104.50	-0.19%
6/25/2014	2,000,000	$101.63	-0.61%	452,000	$104.31	-0.19%
6/26/2014	2,017,000	$101.60	-0.02%	0		
6/27/2014	0			375,000	$104.38	
6/30/2014	2,005,000	$101.66		0		
7/1/2014	1,306,000	$101.80	0.14%	3,205,000	$104.76	
7/2/2014	1,131,000	$102.99	1.16%	1,426,000	$104.51	-0.24%
7/3/2014	0			0		
7/7/2014	1,000,000	$101.69		57,000	$104.50	
7/8/2014	0			1,012,000	$104.48	-0.02%
7/9/2014	103,000	$101.83		172,000	$104.38	-0.10%
7/10/2014	600,000	$101.44	-0.39%	200,000	$104.19	-0.18%

Appendix D-1
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Convertible Notes
July 29, 2013 to October 15, 2015

	TAA Notes			TAB Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
7/11/2014	1,023,000	$101.81	0.37%	123,000	$104.26	0.07%
7/14/2014	700,000	$102.03	0.21%	1,038,000	$105.00	0.70%
7/15/2014	42,000	$102.68	0.64%	1,042,000	$105.23	0.22%
7/16/2014	2,010,000	$102.21	-0.46%	10,000	$105.00	-0.22%
7/17/2014	1,205,000	$102.19	-0.02%	1,060,000	$105.00	0.00%
7/18/2014	2,000,000	$102.19	-0.01%	1,200,000	$105.17	0.16%
7/21/2014	1,000,000	$102.07	-0.12%	50,000	$105.31	0.14%
7/22/2014	52,000	$101.77	-0.29%	3,400,000	$105.23	-0.08%
7/23/2014	0			0		
7/24/2014	3,057,000	$102.14		6,000	$104.13	
7/25/2014	1,020,000	$102.18	0.04%	0		
7/28/2014	4,000,000	$102.22	0.04%	55,000	$104.69	
7/29/2014	3,043,000	$102.61	0.38%	4,000,000	$105.63	0.89%
7/30/2014	10,000	$102.38	-0.23%	45,000	$105.63	0.00%
7/31/2014	5,600,000	$102.28	-0.10%	4,515,000	$105.20	-0.41%
8/1/2014	768,000	$101.81	-0.46%	1,000,000	$105.14	-0.06%
8/4/2014	0			85,000	$105.50	0.34%
8/5/2014	432,000	$102.14		0		
8/6/2014	4,000,000	$101.87	-0.27%	3,000,000	$104.65	
8/7/2014	1,000,000	$101.85	-0.02%	0		
8/8/2014	77,000	$101.88	0.02%	1,270,000	$104.00	
8/11/2014	105,000	$101.25	-0.62%	1,000,000	$104.16	0.15%
8/12/2014	1,050,000	$101.50	0.24%	0		
8/13/2014	455,000	$101.63	0.13%	7,034,000	$103.61	
8/14/2014	15,000	$101.50	-0.12%	488,000	$103.75	0.14%
8/15/2014	1,295,000	$101.72	0.22%	0		
8/18/2014	2,156,000	$101.61	-0.11%	5,055,000	$103.33	
8/19/2014	4,800,000	$101.14	-0.46%	34,000	$101.78	-1.52%
8/20/2014	1,025,000	$101.38	0.23%	3,000,000	$103.57	1.75%
8/21/2014	7,700,000	$101.74	0.35%	7,005,000	$103.94	0.36%
8/22/2014	0			0		
8/25/2014	0			721,000	$103.93	
8/26/2014	300,000	$101.88		0		
8/27/2014	0			0		
8/28/2014	64,000	$101.52		1,000,000	$103.75	
8/29/2014	0			185,000	$104.00	0.24%
9/2/2014	0			0		
9/3/2014	2,061,000	$101.91		12,000	$103.75	
9/4/2014	1,000,000	$101.69	-0.22%	0		
9/5/2014	14,000	$101.40	-0.28%	0		
9/8/2014	0			2,073,000	$103.79	
9/9/2014	0			2,008,000	$103.85	0.06%
9/10/2014	1,688,000	$101.71		2,353,000	$103.56	-0.28%
9/11/2014	15,000	$100.77	-0.93%	0		
9/12/2014	12,000	$100.04	-0.72%	1,000,000	$102.75	
9/15/2014	421,000	$100.98	0.94%	550,000	$101.94	-0.79%
9/16/2014	38,000	$100.50	-0.48%	0		
9/17/2014	180,000	$100.77	0.27%	1,000,000	$102.10	
9/18/2014	1,040,000	$100.75	-0.02%	1,340,000	$101.90	-0.19%
9/19/2014	1,000,000	$100.75	0.00%	0		
9/22/2014	500,000	$100.71	-0.04%	400,000	$101.33	
9/23/2014	510,000	$100.39	-0.32%	2,000,000	$101.13	-0.21%
9/24/2014	2,000,000	$100.13	-0.27%	25,000	$101.00	-0.12%
9/25/2014	150,000	$99.63	-0.50%	218,000	$100.82	-0.18%
9/26/2014	2,000,000	$99.98	0.35%	1,120,000	$101.10	0.28%
9/29/2014	0			0		
9/30/2014	4,000,000	$99.73		0		
10/1/2014	3,000,000	$99.38	-0.35%	2,000,000	$100.02	
10/2/2014	3,638,000	$99.54	0.16%	1,426,000	$99.82	-0.20%
10/3/2014	1,000,000	$99.53	-0.02%	2,000,000	$99.94	0.11%

Appendix D-1
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Convertible Notes
July 29, 2013 to October 15, 2015

	TAA Notes			TAB Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
10/6/2014	4,480,000	$99.31	-0.21%	118,000	$100.38	0.44%
10/7/2014	15,000	$98.63	-0.69%	1,000,000	$99.56	-0.81%
10/8/2014	4,000,000	$98.31	-0.32%	2,785,000	$98.95	-0.62%
10/9/2014	5,000,000	$98.44	0.13%	4,104,000	$99.19	0.25%
10/10/2014	5,000,000	$97.80	-0.65%	2,000,000	$98.85	-0.35%
10/13/2014	2,322,000	$97.71	-0.09%	2,005,000	$98.40	-0.45%
10/14/2014	2,560,000	$97.80	0.09%	1,650,000	$98.80	0.40%
10/15/2014	1,018,000	$97.63	-0.18%	0		
10/16/2014	106,000	$98.32	0.70%	2,334,000	$98.01	
10/17/2014	1,013,000	$98.37	0.06%	1,000,000	$99.56	1.57%
10/20/2014	6,020,000	$97.99	-0.39%	6,577,000	$99.04	-0.53%
10/21/2014	5,835,000	$98.27	0.29%	6,551,000	$99.79	0.76%
10/22/2014	2,050,000	$98.56	0.29%	7,810,000	$100.16	0.37%
10/23/2014	1,500,000	$98.89	0.34%	1,000,000	$100.19	0.03%
10/24/2014	7,065,000	$99.08	0.19%	0		
10/27/2014	1,050,000	$99.40	0.32%	0		
10/28/2014	9,550,000	$99.55	0.15%	7,083,000	$100.90	
10/29/2014	73,550,000	$93.44	-6.34%	21,614,000	$92.69	-8.49%
10/30/2014	19,000,000	$94.00	0.60%	15,000,000	$93.84	1.23%
10/31/2014	15,595,000	$92.59	-1.51%	6,300,000	$92.35	-1.60%
11/3/2014	99,647,000	$85.38	-8.11%	17,500,000	$83.60	-9.95%
11/4/2014	22,250,000	$88.27	3.34%	27,584,000	$87.33	4.36%
11/5/2014	32,108,000	$90.69	2.70%	11,010,000	$90.35	3.40%
11/6/2014	4,012,000	$91.32	0.69%	3,000,000	$91.04	0.77%
11/7/2014	7,000,000	$90.84	-0.53%	5,920,000	$90.76	-0.31%
11/10/2014	9,000,000	$90.01	-0.92%	4,984,000	$90.11	-0.72%
11/11/2014	6,000,000	$89.98	-0.04%	9,250,000	$89.59	-0.57%
11/12/2014	9,200,000	$89.52	-0.51%	5,030,000	$89.28	-0.36%
11/13/2014	3,000,000	$89.58	0.07%	4,000,000	$88.94	-0.38%
11/14/2014	3,700,000	$89.57	-0.01%	4,000,000	$88.93	-0.01%
11/17/2014	0			0		
11/18/2014	4,000,000	$89.03		200,000	$89.00	
11/19/2014	1,700,000	$89.00	-0.04%	0		
11/20/2014	16,682,000	$89.51	0.58%	7,500,000	$89.46	
11/21/2014	8,750,000	$90.51	1.11%	1,165,000	$90.29	0.92%
11/24/2014	3,700,000	$91.22	0.78%	8,000,000	$90.65	0.41%
11/25/2014	3,400,000	$91.00	-0.24%	7,000,000	$90.90	0.27%
11/26/2014	2,600,000	$91.08	0.08%	1,000,000	$91.00	0.11%
11/28/2014	0			0		
12/1/2014	10,000	$91.63		1,400,000	$91.53	
12/2/2014	1,000,000	$91.25	-0.41%	0		
12/3/2014	607,000	$90.93	-0.36%	2,106,000	$91.26	
12/4/2014	1,000,000	$91.28	0.38%	230,000	$91.00	-0.29%
12/5/2014	15,700,000	$91.81	0.58%	4,000,000	$91.84	0.92%
12/8/2014	2,000,000	$92.31	0.55%	0		
12/9/2014	0			6,000,000	$92.34	
12/10/2014	5,230,000	$92.52		2,000,000	$92.38	0.04%
12/11/2014	0			2,000,000	$92.38	0.00%
12/12/2014	9,450,000	$92.31		8,000,000	$91.98	-0.43%
12/15/2014	16,240,000	$89.26	-3.37%	10,800,000	$87.86	-4.58%
12/16/2014	11,000,000	$88.68	-0.65%	8,400,000	$85.46	-2.77%
12/17/2014	7,302,000	$87.89	-0.89%	4,930,000	$86.13	0.78%
12/18/2014	16,250,000	$87.87	-0.02%	6,090,000	$86.43	0.35%
12/19/2014	18,062,000	$87.27	-0.69%	9,500,000	$85.59	-0.97%
12/22/2014	1,000,000	$87.88	0.69%	11,000,000	$87.00	1.63%
12/23/2014	0			2,000,000	$87.26	0.31%
12/24/2014	3,000,000	$89.00		5,000,000	$88.51	1.42%
12/26/2014	120,000	$90.21	1.35%	0		
12/29/2014	3,000,000	$89.17	-1.16%	8,675,000	$88.91	
12/30/2014	5,750,000	$92.41	3.58%	14,625,000	$91.43	2.79%

Appendix D-1
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Convertible Notes
July 29, 2013 to October 15, 2015

	TAA Notes			TAB Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
12/31/2014	0			5,000,000	$91.98	0.60%
1/2/2015	0			0		
1/5/2015	1,064,000	$92.04		5,000,000	$91.83	
1/6/2015	7,250,000	$92.06	0.02%	2,000,000	$91.81	-0.01%
1/7/2015	3,522,000	$92.68	0.67%	0		
1/8/2015	3,580,000	$93.18	0.54%	6,900,000	$93.04	
1/9/2015	6,500,000	$93.46	0.30%	1,000,000	$93.01	-0.03%
1/12/2015	6,250,000	$94.24	0.83%	1,000,000	$93.25	0.26%
1/13/2015	2,000,000	$93.88	-0.39%	5,000,000	$93.25	0.00%
1/14/2015	2,000,000	$93.38	-0.54%	2,000,000	$93.38	0.13%
1/15/2015	2,000,000	$93.50	0.13%	1,000,000	$93.13	-0.27%
1/16/2015	3,000,000	$93.25	-0.27%	1,200,000	$92.55	-0.62%
1/20/2015	0			0		
1/21/2015	0			2,000,000	$91.88	
1/22/2015	7,810,000	$93.97		4,610,000	$93.04	1.26%
1/23/2015	264,000	$94.00	0.03%	2,100,000	$93.43	0.43%
1/26/2015	1,060,000	$94.02	0.02%	0		
1/27/2015	0			0		
1/28/2015	7,500,000	$93.79		0		
1/29/2015	630,000	$93.39	-0.43%	1,000,000	$92.63	
1/30/2015	2,000,000	$93.13	-0.28%	0		
2/2/2015	4,000,000	$93.44	0.34%	2,000,000	$92.63	
2/3/2015	2,007,000	$93.49	0.06%	5,000,000	$92.88	0.27%
2/4/2015	7,000,000	$93.70	0.22%	0		
2/5/2015	2,000,000	$93.44	-0.28%	0		
2/6/2015	1,000,000	$93.50	0.07%	4,600,000	$92.81	
2/9/2015	0			0		
2/10/2015	13,055,000	$93.51		5,012,000	$92.22	
2/11/2015	5,000,000	$93.75	0.25%	3,000,000	$92.63	0.43%
2/12/2015	5,000,000	$93.75	-0.01%	4,000,000	$92.56	-0.07%
2/13/2015	0			0		
2/17/2015	0			4,000,000	$92.59	
2/18/2015	4,000	$91.38		0		
2/19/2015	0			55,000	$93.13	
2/20/2015	2,000,000	$93.75		2,000,000	$92.63	-0.54%
2/23/2015	5,652,000	$94.04	0.31%	0		
2/24/2015	8,105,000	$94.11	0.08%	3,170,000	$93.38	
2/25/2015	6,656,000	$94.37	0.28%	2,310,000	$93.58	0.21%
2/26/2015	5,000,000	$94.38	0.00%	3,000,000	$93.71	0.14%
2/27/2015	7,500,000	$95.28	0.95%	4,000,000	$94.56	0.91%
3/2/2015	18,120,000	$97.28	2.07%	31,659,000	$97.67	3.23%
3/3/2015	10,051,000	$96.62	-0.67%	2,000,000	$97.38	-0.30%
3/4/2015	12,550,000	$96.90	0.28%	4,000,000	$97.56	0.19%
3/5/2015	0			5,000,000	$97.83	0.27%
3/6/2015	12,200,000	$96.26		12,080,000	$97.69	-0.13%
3/9/2015	0			2,000,000	$97.63	-0.07%
3/10/2015	950,000	$95.88		500,000	$97.63	0.00%
3/11/2015	13,052,000	$96.85	1.01%	1,000,000	$97.50	-0.13%
3/12/2015	2,100,000	$96.83	-0.02%	3,000,000	$97.42	-0.09%
3/13/2015	3,700,000	$96.98	0.15%	60,000	$97.40	-0.02%
3/16/2015	450,000	$96.98	0.00%	2,000,000	$97.56	0.17%
3/17/2015	8,000,000	$96.95	-0.03%	1,000,000	$97.50	-0.06%
3/18/2015	85,000	$96.88	-0.08%	450,000	$97.92	0.43%
3/19/2015	1,000,000	$97.25	0.39%	0		
3/20/2015	3,000,000	$97.33	0.09%	1,000,000	$97.88	
3/23/2015	1,218,000	$97.36	0.03%	5,770,000	$98.03	0.16%
3/24/2015	1,008,000	$97.49	0.14%	2,840,000	$98.03	-0.01%
3/25/2015	0			1,000,000	$98.25	0.23%
3/26/2015	20,000	$97.00		0		
3/27/2015	100,000	$96.40	-0.62%	2,000,000	$98.50	

Appendix D-1
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Convertible Notes
July 29, 2013 to October 15, 2015

	TAA Notes			TAB Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
3/30/2015	0			3,000,000	$98.46	-0.04%
3/31/2015	6,000,000	$97.82		2,000,000	$98.44	-0.02%
4/1/2015	0			3,500,000	$98.18	-0.26%
4/2/2015	850,000	$97.83		0		
4/6/2015	1,000,000	$97.75	-0.08%	8,415,000	$98.49	
4/7/2015	2,019,000	$97.74	-0.01%	2,200,000	$98.56	0.07%
4/8/2015	1,140,000	$97.58	-0.17%	1,700,000	$98.39	-0.17%
4/9/2015	3,004,000	$97.81	0.24%	0		
4/10/2015	2,000,000	$97.88	0.06%	5,600,000	$98.32	
4/13/2015	3,500,000	$97.77	-0.11%	0		
4/14/2015	50,000	$98.12	0.36%	1,000,000	$98.25	
4/15/2015	2,000,000	$97.75	-0.38%	4,500,000	$98.03	-0.22%
4/16/2015	1,006,000	$96.88	-0.89%	0		
4/17/2015	2,500,000	$97.28	0.40%	1,000,000	$98.00	
4/20/2015	2,000,000	$97.15	-0.13%	10,000,000	$97.54	-0.47%
4/21/2015	1,000	$96.50	-0.67%	4,000,000	$97.41	-0.13%
4/22/2015	1,015,000	$97.43	0.96%	4,000,000	$97.43	0.02%
4/23/2015	410,000	$97.33	-0.11%	0		
4/24/2015	1,000,000	$97.25	-0.08%	300,000	$97.55	
4/27/2015	3,550,000	$97.30	0.05%	0		
4/28/2015	1,004,000	$97.12	-0.19%	0		
4/29/2015	0			2,225,000	$97.52	
4/30/2015	68,000	$98.24		0		
5/1/2015	3,000,000	$97.16	-1.10%	0		
5/4/2015	0			0		
5/5/2015	1,012,000	$97.24		0		
5/6/2015	3,250,000	$96.85	-0.41%	0		
5/7/2015	3,000	$95.17	-1.75%	0		
5/8/2015	4,000,000	$96.73	1.63%	2,000,000	$96.75	
5/11/2015	6,355,000	$96.61	-0.13%	0		
5/12/2015	3,000,000	$96.46	-0.16%	1,500,000	$96.13	
5/13/2015	22,000	$96.25	-0.22%	1,100,000	$96.77	0.67%
5/14/2015	79,000	$96.74	0.51%	2,000,000	$96.65	-0.13%
5/15/2015	1,000,000	$96.75	0.01%	1,000,000	$96.75	0.10%
5/18/2015	1,000,000	$96.75	0.00%	2,000,000	$96.63	-0.13%
5/19/2015	3,000	$96.50	-0.26%	8,000	$97.00	0.39%
5/20/2015	0			0		
5/21/2015	1,012,000	$96.62		400,000	$97.00	
5/22/2015	0			200,000	$96.88	-0.13%
5/26/2015	520,000	$96.43		0		
5/27/2015	201,000	$96.25	-0.18%	3,200,000	$96.43	
5/28/2015	394,000	$96.34	0.09%	2,000,000	$96.38	-0.06%
5/29/2015	0			500,000	$96.38	0.00%
6/1/2015	195,000	$94.79		1,000,000	$96.38	0.00%
6/2/2015	4,154,000	$95.77	1.02%	3,000,000	$96.15	-0.23%
6/3/2015	0			0		
6/4/2015	9,000	$94.35		0		
6/5/2015	1,000,000	$95.13	0.82%	0		
6/8/2015	1,000,000	$94.75	-0.39%	521,000	$95.13	
6/9/2015	3,103,000	$94.68	-0.07%	1,000,000	$95.38	0.26%
6/10/2015	2,000,000	$94.53	-0.17%	2,300,000	$95.12	-0.26%
6/11/2015	1,042,000	$94.76	0.25%	0		
6/12/2015	1,000,000	$94.75	-0.01%	0		
6/15/2015	852,000	$94.37	-0.40%	200,000	$94.50	
6/16/2015	8,000	$94.13	-0.26%	0		
6/17/2015	2,010,000	$94.47	0.37%	54,000	$95.25	
6/18/2015	2,000	$94.38	-0.10%	1,000,000	$95.38	0.13%
6/19/2015	1,000,000	$95.00	0.66%	0		
6/22/2015	0			0		
6/23/2015	1,031,000	$94.75		0		

Appendix D-1
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Convertible Notes
July 29, 2013 to October 15, 2015

	TAA Notes			TAB Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
6/24/2015	2,000,000	$94.94	0.20%	300,000	$95.00	
6/25/2015	57,000	$95.49	0.58%	0		
6/26/2015	1,000,000	$94.38	-1.18%	0		
6/29/2015	6,000	$92.98	-1.49%	3,000,000	$94.00	
6/30/2015	1,000,000	$94.38	1.49%	4,000,000	$93.88	-0.13%
7/1/2015	1,031,000	$94.24	-0.14%	1,000,000	$93.75	-0.13%
7/2/2015	3,000	$91.32	-3.15%	0		
7/6/2015	0			0		
7/7/2015	1,128,000	$94.51		1,000,000	$94.00	
7/8/2015	1,018,000	$94.45	-0.06%	2,000,000	$94.00	0.00%
7/9/2015	1,027,000	$94.52	0.07%	1,500,000	$94.04	0.04%
7/10/2015	6,000,000	$94.63	0.12%	0		
7/13/2015	7,002,000	$94.87	0.26%	2,000,000	$94.06	
7/14/2015	9,000	$92.73	-2.28%	3,517,000	$94.04	-0.02%
7/15/2015	1,000,000	$95.00	2.41%	7,050,000	$94.38	0.36%
7/16/2015	1,009,000	$95.24	0.25%	6,046,000	$94.54	0.16%
7/17/2015	0			6,000,000	$94.80	0.28%
7/20/2015	1,808,000	$95.48		6,000,000	$95.26	0.48%
7/21/2015	93,000	$95.57	0.10%	500,000	$95.00	-0.27%
7/22/2015	1,000,000	$95.50	-0.08%	0		
7/23/2015	7,009,000	$95.15	-0.37%	2,000,000	$94.31	
7/24/2015	40,000	$96.38	1.28%	0		
7/27/2015	3,768,000	$94.77	-1.68%	1,682,000	$94.35	
7/28/2015	6,289,000	$94.96	0.20%	4,265,000	$93.82	-0.56%
7/29/2015	75,000	$94.54	-0.44%	1,000,000	$94.00	0.19%
7/30/2015	0			0		
7/31/2015	0			1,682,000	$94.38	
8/3/2015	6,000	$90.22		0		
8/4/2015	49,000	$95.62	5.82%	0		
8/5/2015	1,000,000	$95.25	-0.39%	2,000,000	$94.48	
8/6/2015	2,722,000	$95.47	0.23%	0		
8/7/2015	30,000	$95.23	-0.26%	0		
8/10/2015	4,000,000	$95.63	0.42%	1,155,000	$94.61	
8/11/2015	8,545,000	$95.58	-0.05%	5,000,000	$94.35	-0.27%
8/12/2015	0			0		
8/13/2015	2,348,000	$95.24		3,000,000	$94.13	
8/14/2015	131,000	$95.13	-0.12%	0		
8/17/2015	377,000	$95.13	0.00%	3,000,000	$93.54	
8/18/2015	6,070,000	$95.24	0.12%	0		
8/19/2015	20,000	$95.38	0.14%	0		
8/20/2015	4,015,000	$94.87	-0.53%	107,000	$93.50	
8/21/2015	1,000	$93.75	-1.19%	0		
8/24/2015	8,096,000	$94.39	0.68%	3,000,000	$91.85	
8/25/2015	1,000,000	$94.63	0.25%	3,500,000	$91.29	-0.61%
8/26/2015	1,000,000	$94.75	0.13%	1,000,000	$92.00	0.77%
8/27/2015	3,001,000	$94.96	0.22%	225,000	$92.00	0.00%
8/28/2015	2,000,000	$94.81	-0.15%	1,000,000	$92.50	0.54%
8/31/2015	0			0		
9/1/2015	0			1,000,000	$92.75	
9/2/2015	2,000,000	$94.90		3,000,000	$92.63	-0.13%
9/3/2015	13,000	$94.06	-0.89%	3,000,000	$92.67	0.04%
9/4/2015	2,000,000	$95.19	1.19%	0		
9/8/2015	0			0		
9/9/2015	0			3,000,000	$93.08	
9/10/2015	0			1,000,000	$92.88	-0.22%
9/11/2015	0			2,582,000	$92.69	-0.20%
9/14/2015	0			0		
9/15/2015	0			0		
9/16/2015	1,000,000	$95.50		0		
9/17/2015	0			0		

Appendix D-1
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Convertible Notes
July 29, 2013 to October 15, 2015

	TAA Notes			TAB Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
9/18/2015	2,000,000	$95.46		2,000,000	$92.88	
9/21/2015	2,000,000	$95.65	0.20%	200,000	$93.88	1.07%
9/22/2015	3,000	$94.88	-0.81%	0		
9/23/2015	0			0		
9/24/2015	2,008,000	$95.50		2,000,000	$92.97	
9/25/2015	0			3,370,000	$93.01	0.04%
9/28/2015	2,004,000	$95.23		0		
9/29/2015	3,150,000	$95.11	-0.12%	0		
9/30/2015	0			500,000	$93.13	
10/1/2015	1,000,000	$95.00		0		
10/2/2015	9,013,000	$94.77	-0.24%	1,003,000	$92.25	
10/5/2015	1,000,000	$95.00	0.24%	1,000,000	$92.38	0.13%
10/6/2015	4,501,000	$94.90	-0.10%	2,000,000	$92.31	-0.07%
10/7/2015	3,500,000	$94.99	0.09%	1,000,000	$92.50	0.20%
10/8/2015	0			2,300,000	$92.41	-0.10%
10/9/2015	0			5,125,000	$92.85	0.48%
10/12/2015	0			1,000,000	$93.00	0.16%
10/13/2015	2,000,000	$95.35		1,000,000	$93.00	0.00%
10/14/2015	150,000	$95.55	0.21%	1,000,000	$93.38	0.40%
10/15/2015	0			1,000,000	$93.13	-0.27%

Source: FINRA TRACE data, FINRA0000001-007, FINRA0000014.

Notes:
[1] Values are calculated after correcting Dr. Feinstein's organization of the TRACE data, as described in Section VI.B-C.
[2] Volume and VWAP include trades that occur before 9:30AM and after 4:00PM.

Appendix D-2
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
144A Notes
February 6, 2014 to October 16, 2014

	QAA Notes			QAC Notes			QAE Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
2/6/2014	4,000,000	$100.13		3,000,000	$99.90		9,000,000	$99.81	
2/7/2014	1,000,000	$100.31	0.17%	1,000,000	$99.91	0.01%	2,000,000	$99.80	-0.01%
2/10/2014	0			0			4,045,000	$99.93	0.14%
2/11/2014	5,000,000	$100.12		1,070,000	$99.82		3,000,000	$99.60	-0.34%
2/12/2014	5,000,000	$99.99	-0.13%	2,275,000	$99.87	0.06%	5,000,000	$99.49	-0.11%
2/13/2014	6,000,000	$100.14	0.15%	5,000,000	$100.00	0.12%	250,000	$99.92	0.44%
2/14/2014	200,000	$100.23	0.09%	0			11,000	$99.49	-0.43%
2/18/2014	5,500,000	$100.25	0.03%	1,611,000	$100.30		0		
2/19/2014	23,125,000	$100.23	-0.02%	8,305,000	$100.43	0.13%	1,500,000	$100.00	
2/20/2014	12,500,000	$100.10	-0.14%	100,000	$99.96	-0.47%	12,000,000	$99.65	-0.35%
2/21/2014	6,000,000	$100.14	0.04%	0			850,000	$99.75	0.09%
2/24/2014	4,390,000	$100.05	-0.08%	1,285,000	$99.99		0		
2/25/2014	4,625,000	$100.20	0.14%	0			1,140,000	$100.31	
2/26/2014	20,200,000	$100.28	0.08%	2,650,000	$100.46		6,185,000	$100.44	0.14%
2/27/2014	1,075,000	$100.44	0.16%	715,000	$100.61	0.14%	5,500,000	$100.91	0.46%
2/28/2014	11,040,000	$100.48	0.04%	4,400,000	$100.46	-0.14%	4,250,000	$100.89	-0.01%
3/3/2014	5,000,000	$100.53	0.05%	0			350,000	$101.37	0.47%
3/4/2014	5,500,000	$100.43	-0.09%	5,050,000	$100.48		0		
3/5/2014	9,870,000	$100.48	0.04%	5,000,000	$100.40	-0.08%	5,690,000	$100.40	
3/6/2014	2,580,000	$100.49	0.02%	0			3,000,000	$100.11	-0.29%
3/7/2014	0			5,000,000	$99.84		3,090,000	$98.98	-1.14%
3/10/2014	1,050,000	$100.25		0			0		
3/11/2014	250,000	$100.06	-0.18%	16,090,000	$99.88		5,290,000	$99.31	
3/12/2014	0			10,100,000	$100.13	0.25%	26,230,000	$99.90	0.59%
3/13/2014	10,000,000	$100.35		0			10,000,000	$100.32	0.42%
3/14/2014	5,000,000	$100.40	0.06%	0			0		
3/17/2014	240,000	$100.12	-0.28%	430,000	$100.17		8,805,000	$100.20	
3/18/2014	750,000	$100.31	0.18%	8,875,000	$100.22	0.05%	0		
3/19/2014	0			5,000,000	$100.24	0.01%	0		
3/20/2014	0			50,000	$99.52	-0.72%	250,000	$99.66	
3/21/2014	240,000	$99.93		0			0		
3/24/2014	2,000,000	$100.03	0.10%	0			0		
3/25/2014	10,045,000	$99.90	-0.13%	0			325,000	$99.53	
3/26/2014	1,350,000	$100.21	0.30%	9,000	$99.77		0		
3/27/2014	0			0			0		
3/28/2014	250,000	$100.21		0			700,000	$100.33	
3/31/2014	0			100,000	$99.46		1,900,000	$100.20	-0.12%
4/1/2014	0			0			3,298,000	$100.22	0.01%
4/2/2014	820,000	$100.04		0			3,150,000	$99.96	-0.25%
4/3/2014	2,735,000	$100.09	0.05%	0			1,250,000	$100.23	0.27%
4/4/2014	10,000,000	$100.32	0.23%	0			0		
4/7/2014	0			4,700,000	$100.06		6,227,000	$100.57	
4/8/2014	4,000,000	$100.18		2,666,000	$100.27	0.20%	0		
4/9/2014	1,825,000	$100.24	0.06%	0			0		
4/10/2014	100,000	$100.31	0.07%	0			450,000	$101.72	
4/11/2014	0			0			0		
4/14/2014	0			0			0		
4/15/2014	0			4,000,000	$100.48		0		
4/16/2014	0			132,000	$100.27	-0.21%	0		
4/17/2014	0			0			75,000	$100.37	
4/21/2014	0			0			0		
4/22/2014	0			0			0		
4/23/2014	0			2,000,000	$100.07		0		
4/24/2014	3,000,000	$100.36		4,741,000	$100.13	0.06%	0		
4/25/2014	0			1,270,000	$100.22	0.09%	0		
4/28/2014	500,000	$100.10		17,000,000	$99.86	-0.36%	10,275,000	$101.02	
4/29/2014	0			10,419,000	$99.98	0.11%	4,585,000	$101.02	0.01%
4/30/2014	500,000	$100.48		15,000,000	$100.16	0.18%	3,275,000	$101.16	0.14%
5/1/2014	0			5,250,000	$100.32	0.16%	0		
5/2/2014	0			100,000	$100.36	0.04%	0		

Appendix D-2
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
144A Notes
February 6, 2014 to October 16, 2014

	QAA Notes			QAC Notes			QAE Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
5/5/2014	0			0			0		
5/6/2014	50,000	$99.97		0			5,375,000	$101.97	
5/7/2014	2,250,000	$100.51	0.53%	0			10,115,000	$101.95	-0.03%
5/8/2014	0			96,000	$100.48		1,500,000	$101.81	-0.14%
5/9/2014	0			0			0		
5/12/2014	500,000	$99.78		0			0		
5/13/2014	0			200,000	$100.64		9,075,000	$101.67	
5/14/2014	65,000	$100.23		5,795,000	$100.76	0.11%	11,000,000	$102.19	0.51%
5/15/2014	0			10,500,000	$100.81	0.06%	28,450,000	$102.23	0.05%
5/16/2014	5,061,000	$100.43		5,000,000	$100.58	-0.24%	0		
5/19/2014	0			320,000	$100.62	0.05%	0		
5/20/2014	375,000	$100.59		740,000	$100.58	-0.04%	0		
5/21/2014	0			10,085,000	$100.90	0.32%	32,780,000	$102.47	
5/22/2014	0			5,400,000	$100.75	-0.15%	0		
5/23/2014	0			5,000,000	$100.92	0.17%	5,150,000	$102.22	
5/27/2014	10,000,000	$100.65		5,000,000	$100.85	-0.07%	0		
5/28/2014	700,000	$100.75	0.10%	0			12,445,000	$102.87	
5/29/2014	8,400,000	$100.77	0.03%	0			0		
5/30/2014	5,230,000	$100.71	-0.06%	0			0		
6/2/2014	185,000	$100.89	0.18%	5,000,000	$100.74		0		
6/3/2014	0			0			5,000,000	$101.64	
6/4/2014	550,000	$100.43		0			0		
6/5/2014	10,750,000	$100.58	0.16%	15,200,000	$100.47		1,005,000	$102.06	
6/6/2014	2,145,000	$100.59	0.00%	55,000	$100.19	-0.28%	4,085,000	$102.06	0.00%
6/9/2014	0			10,820,000	$100.33	0.14%	0		
6/10/2014	0			10,000,000	$100.18	-0.16%	500,000	$101.39	
6/11/2014	0			735,000	$100.27	0.10%	1,056,000	$101.45	0.06%
6/12/2014	250,000	$100.54		0			1,500,000	$101.83	0.38%
6/13/2014	4,000,000	$100.28	-0.25%	10,000,000	$100.16		0		
6/16/2014	60,000	$99.76	-0.52%	1,095,000	$99.98	-0.18%	0		
6/17/2014	476,000	$100.10	0.34%	308,000	$99.71	-0.27%	0		
6/18/2014	50,000	$100.07	-0.03%	905,000	$99.99	0.28%	0		
6/19/2014	0			6,095,000	$100.17	0.18%	85,000	$101.69	
6/20/2014	0			0			0		
6/23/2014	0			800,000	$100.19		0		
6/24/2014	860,000	$100.29		0			2,740,000	$102.38	
6/25/2014	0			5,000,000	$100.56		0		
6/26/2014	210,000	$100.16		0			180,000	$101.87	
6/27/2014	9,190,000	$100.36	0.20%	0			25,000	$102.98	1.09%
6/30/2014	710,000	$100.45	0.08%	300,000	$100.63		170,000	$102.09	-0.87%
7/1/2014	10,150,000	$100.41	-0.04%	9,700,000	$100.56	-0.07%	4,900,000	$102.15	0.06%
7/2/2014	2,300,000	$100.39	-0.02%	1,000,000	$100.49	-0.07%	39,000	$102.29	0.13%
7/3/2014	0			0			0		
7/7/2014	1,950,000	$100.30		0			100,000	$102.18	
7/8/2014	0			0			0		
7/9/2014	0			0			0		
7/10/2014	0			0			0		
7/11/2014	0			0			0		
7/14/2014	225,000	$100.38		0			1,030,000	$102.09	
7/15/2014	1,160,000	$100.17	-0.21%	0			5,000,000	$102.27	0.18%
7/16/2014	0			0			2,350,000	$102.31	0.04%
7/17/2014	10,500,000	$100.26		0			15,000	$101.84	-0.46%
7/18/2014	2,990,000	$100.24	-0.02%	3,060,000	$100.64		0		
7/21/2014	0			0			350,000	$103.22	
7/22/2014	0			5,240,000	$100.62		0		
7/23/2014	250,000	$100.49		50,000	$101.10	0.48%	0		
7/24/2014	0			0			0		
7/25/2014	100,000	$100.42		0			0		
7/28/2014	15,750,000	$100.26	-0.16%	0			5,555,000	$102.56	
7/29/2014	3,900,000	$100.42	0.17%	1,500,000	$100.47		30,000	$102.19	-0.36%

Appendix D-2
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
144A Notes
February 6, 2014 to October 16, 2014

	QAA Notes			QAC Notes			QAE Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
7/30/2014	350,000	$100.12	-0.30%	0			4,300,000	$102.14	-0.05%
7/31/2014	1,020,000	$100.20	0.08%	7,205,000	$100.00		5,000,000	$101.58	-0.55%
8/1/2014	0			0			0		
8/4/2014	0			5,000,000	$100.54		500,000	$102.57	
8/5/2014	0			76,000	$100.15	-0.38%	0		
8/6/2014	0			0			1,740,000	$102.55	
8/7/2014	0			0			2,035,000	$102.62	0.06%
8/8/2014	0			0			0		
8/11/2014	0			0			220,000	$102.60	
8/12/2014	0			100,000	$100.29		0		
8/13/2014	0			0			450,000	$103.29	
8/14/2014	350,000	$100.44		425,000	$100.41		220,000	$103.05	-0.23%
8/15/2014	0			0			0		
8/18/2014	0			700,000	$100.36		0		
8/19/2014	0			0			0		
8/20/2014	13,390,000	$100.27		20,100,000	$100.25		0		
8/21/2014	12,750,000	$100.31	0.04%	10,000,000	$100.28	0.02%	230,000	$102.52	
8/22/2014	0			0			0		
8/25/2014	0			0			0		
8/26/2014	0			1,202,000	$100.31		0		
8/27/2014	0			2,400,000	$100.42	0.11%	0		
8/28/2014	0			5,000,000	$100.30	-0.11%	0		
8/29/2014	50,000	$100.28		2,599,000	$100.49	0.19%	0		
9/2/2014	0			190,000	$100.26	-0.24%	0		
9/3/2014	0			0			0		
9/4/2014	300,000	$100.07		0			870,000	$102.90	
9/5/2014	0			4,401,000	$100.35		550,000	$102.38	-0.51%
9/8/2014	0			0			5,320,000	$102.23	-0.15%
9/9/2014	2,015,000	$100.16		5,000,000	$99.99		2,260,000	$101.93	-0.29%
9/10/2014	5,000,000	$99.98	-0.18%	0			0		
9/11/2014	7,500,000	$100.08	0.11%	11,000,000	$99.85		0		
9/12/2014	100,000	$100.09	0.00%	6,320,000	$99.75	-0.09%	1,050,000	$101.36	
9/15/2014	0			300,000	$99.63	-0.12%	0		
9/16/2014	10,000,000	$100.07		0			0		
9/17/2014	250,000	$100.12	0.05%	550,000	$99.58		0		
9/18/2014	70,000	$99.71	-0.41%	995,000	$99.66	0.07%	0		
9/19/2014	500,000	$99.86	0.14%	50,000	$99.66	0.00%	0		
9/22/2014	0			225,000	$99.73	0.08%	0		
9/23/2014	0			4,000,000	$99.54	-0.19%	0		
9/24/2014	0			0			0		
9/25/2014	0			50,000	$100.10		0		
9/26/2014	500,000	$100.05		2,000,000	$99.20	-0.90%	0		
9/29/2014	0			5,980,000	$99.44	0.24%	0		
9/30/2014	500,000	$100.03		5,220,000	$99.33	-0.11%	250,000	$101.60	
10/1/2014	1,450,000	$100.12	0.09%	5,000,000	$99.70	0.36%	3,290,000	$102.02	0.41%
10/2/2014	20,500,000	$100.13	0.01%	20,000,000	$99.78	0.08%	0		
10/3/2014	500,000	$99.96	-0.17%	0			4,050,000	$102.39	
10/6/2014	0			0			0		
10/7/2014	10,200,000	$100.15		10,000,000	$99.83		2,795,000	$102.93	
10/8/2014	5,000,000	$100.20	0.04%	5,000,000	$100.47	0.63%	0		

Appendix D-2
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
144A Notes
February 6, 2014 to October 16, 2014

	QAA Notes			QAC Notes			QAE Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
10/9/2014	5,000,000	$100.36	0.16%	0			0		
10/10/2014	22,640,000	$100.30	-0.06%	20,000,000	$100.37		0		
10/13/2014	0			0			0		
10/14/2014	0			0			0		
10/15/2014	0			0			0		
10/16/2014	0			0			3,000,000	$104.19	

Source: FINRA TRACE data, FINRA0000001-007, FINRA0000014.

Notes:
[1] Values are calculated after correcting Dr. Feinstein's organization of the TRACE data, as described in Section VI.B-C.
[2] Volume and VWAP include trades that occur before 9:30AM and after 4:00PM.

Appendix D-3
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Exchange Notes
October 14, 2014 to October 15, 2015

	QAB Notes			QAD Notes			QAF Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
10/16/2014	0			0			0		
10/17/2014	0			0			0		
10/20/2014	0			5,000,000	$100.91		0		
10/21/2014	0			0			0		
10/22/2014	755,000	$100.53		0			790,000	$104.10	
10/23/2014	1,355,000	$100.42	-0.10%	200,000	$100.71		575,000	$103.59	-0.49%
10/24/2014	600,000	$100.40	-0.02%	250,000	$100.39	-0.32%	2,675,000	$103.39	-0.20%
10/27/2014	0			0			0		
10/28/2014	8,135,000	$100.43		10,008,000	$100.48		5,000,000	$103.87	
10/29/2014	89,795,000	$98.75	-1.69%	168,115,000	$98.01	-2.48%	19,675,000	$98.54	-5.26%
10/30/2014	46,520,000	$98.10	-0.66%	29,320,000	$97.38	-0.65%	6,663,000	$98.29	-0.26%
10/31/2014	15,450,000	$97.73	-0.38%	62,119,000	$96.79	-0.61%	27,200,000	$97.44	-0.87%
11/3/2014	40,685,000	$95.86	-1.94%	37,522,000	$93.80	-3.14%	25,789,000	$93.13	-4.53%
11/4/2014	31,555,000	$94.90	-1.00%	47,025,000	$93.62	-0.19%	11,758,000	$92.27	-0.92%
11/5/2014	54,000,000	$95.26	0.38%	8,760,000	$94.38	0.81%	2,595,000	$93.56	1.39%
11/6/2014	7,465,000	$95.81	0.58%	9,000,000	$94.71	0.35%	5,040,000	$93.72	0.18%
11/7/2014	16,516,000	$95.87	0.06%	10,200,000	$94.74	0.03%	120,000	$95.73	2.12%
11/10/2014	1,300,000	$95.78	-0.09%	0			8,365,000	$95.20	-0.56%
11/11/2014	0			0			0		
11/12/2014	4,483,000	$95.99		2,155,000	$95.40		8,005,000	$94.84	
11/13/2014	2,230,000	$96.18	0.19%	0			95,000	$97.03	2.28%
11/14/2014	11,143,000	$95.37	-0.84%	10,000,000	$94.05		0		
11/17/2014	1,709,000	$95.65	0.29%	12,300,000	$94.08	0.04%	355,000	$94.29	
11/18/2014	50,520,000	$95.79	0.15%	100,000	$94.62	0.57%	110,000	$95.62	1.39%
11/19/2014	10,044,000	$95.83	0.04%	45,000	$94.85	0.24%	4,402,000	$94.49	-1.18%
11/20/2014	20,125,000	$95.78	-0.05%	175,000	$94.91	0.06%	221,000	$94.34	-0.16%
11/21/2014	10,020,000	$95.85	0.07%	20,000	$95.70	0.83%	118,000	$96.37	2.12%
11/24/2014	15,372,000	$95.93	0.09%	160,000	$95.87	0.18%	40,000	$96.63	0.26%
11/25/2014	8,406,000	$95.91	-0.03%	5,000,000	$94.45	-1.49%	0		
11/26/2014	0			0			0		
11/28/2014	0			0			145,000	$96.02	
12/1/2014	2,300,000	$96.29		0			4,000,000	$95.52	-0.52%
12/2/2014	24,165,000	$95.96	-0.34%	5,170,000	$94.85		0		
12/3/2014	345,000	$96.30	0.35%	10,040,000	$95.12	0.28%	125,000	$93.71	
12/4/2014	550,000	$96.23	-0.07%	700,000	$95.30	0.19%	5,680,000	$95.12	1.49%
12/5/2014	60,000	$96.39	0.17%	0			0		
12/8/2014	0			0			3,000,000	$95.49	
12/9/2014	380,000	$96.59		5,760,000	$95.68		0		
12/10/2014	181,000	$95.94	-0.68%	0			2,675,000	$95.64	
12/11/2014	7,090,000	$96.50	0.59%	0			717,000	$96.19	0.58%
12/12/2014	0			45,000	$95.93		1,995,000	$96.45	0.26%
12/15/2014	15,251,000	$95.33		34,710,000	$94.22	-1.80%	259,000	$95.82	-0.65%
12/16/2014	13,505,000	$94.06	-1.34%	21,110,000	$92.35	-2.00%	120,000	$93.43	-2.53%
12/17/2014	13,621,000	$92.67	-1.49%	22,095,000	$90.12	-2.45%	7,800,000	$87.69	-6.34%
12/18/2014	47,030,000	$91.87	-0.86%	40,900,000	$89.08	-1.16%	31,990,000	$87.00	-0.79%
12/19/2014	12,055,000	$91.52	-0.39%	10,410,000	$88.35	-0.82%	7,910,000	$86.83	-0.19%
12/22/2014	9,935,000	$91.87	0.39%	4,500,000	$89.44	1.23%	3,000,000	$86.71	-0.14%
12/23/2014	11,540,000	$93.08	1.30%	7,874,000	$89.78	0.37%	1,000,000	$87.50	0.91%
12/24/2014	3,860,000	$93.16	0.09%	0			0		
12/26/2014	0			0			0		
12/29/2014	3,000,000	$94.47		10,000	$91.46		2,798,000	$88.10	
12/30/2014	12,250,000	$95.36	0.94%	3,003,000	$92.32	0.94%	6,700,000	$91.06	3.30%
12/31/2014	9,000,000	$95.37	0.01%	4,000,000	$92.80	0.52%	1,500,000	$92.23	1.28%
1/2/2015	2,600,000	$95.78	0.43%	2,428,000	$93.79	1.07%	620,000	$92.15	-0.09%
1/5/2015	7,325,000	$95.61	-0.18%	8,732,000	$94.07	0.29%	950,000	$92.26	0.12%
1/6/2015	11,044,000	$95.43	-0.19%	450,000	$94.05	-0.02%	2,200,000	$92.19	-0.08%
1/7/2015	6,000,000	$95.41	-0.02%	2,000,000	$94.63	0.61%	1,000,000	$93.25	1.14%
1/8/2015	9,530,000	$95.74	0.35%	4,600,000	$95.02	0.42%	5,850,000	$94.96	1.81%
1/9/2015	1,030,000	$95.38	-0.37%	1,025,000	$95.02	0.00%	4,000,000	$95.18	0.24%
1/12/2015	1,015,000	$95.50	0.13%	2,600,000	$94.87	-0.16%	5,705,000	$95.98	0.84%

Appendix D-3
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Exchange Notes
October 14, 2014 to October 15, 2015

	QAB Notes			QAD Notes			QAF Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
1/13/2015	7,250,000	$95.36	-0.15%	0			7,113,000	$96.29	0.32%
1/14/2015	3,000,000	$95.13	-0.24%	0			1,600,000	$96.26	-0.03%
1/15/2015	5,000,000	$94.57	-0.58%	1,835,000	$94.89		300,000	$96.25	-0.01%
1/16/2015	4,630,000	$94.59	0.02%	2,000,000	$95.06	0.18%	4,000,000	$96.00	-0.26%
1/20/2015	4,620,000	$94.74	0.15%	3,000,000	$95.33	0.28%	0		
1/21/2015	15,000	$95.70	1.01%	0			2,000,000	$96.63	
1/22/2015	10,300,000	$96.17	0.49%	4,000,000	$96.00		2,500,000	$96.95	0.34%
1/23/2015	435,000	$97.03	0.89%	4,215,000	$96.01	0.01%	7,000,000	$97.21	0.27%
1/26/2015	2,000,000	$95.94	-1.14%	5,000	$96.83	0.85%	1,000,000	$97.00	-0.22%
1/27/2015	1,300,000	$95.86	-0.08%	0			0		
1/28/2015	0			0			2,000,000	$97.00	
1/29/2015	3,250,000	$96.12		2,420,000	$96.05		0		
1/30/2015	4,280,000	$96.08	-0.03%	2,900,000	$95.91	-0.14%	525,000	$97.18	
2/2/2015	2,000,000	$96.06	-0.02%	0			200,000	$97.25	0.07%
2/3/2015	1,060,000	$96.01	-0.06%	1,880,000	$95.98		0		
2/4/2015	1,212,000	$96.08	0.07%	1,836,000	$95.43	-0.58%	6,000,000	$97.27	
2/5/2015	3,200,000	$95.95	-0.13%	0			2,150,000	$97.38	0.12%
2/6/2015	4,510,000	$96.08	0.14%	2,000,000	$95.75		3,000,000	$97.25	-0.14%
2/9/2015	6,210,000	$96.06	-0.02%	30,000	$96.00	0.26%	1,000,000	$97.50	0.26%
2/10/2015	2,200,000	$96.05	-0.01%	3,363,000	$95.91	-0.09%	0		
2/11/2015	750,000	$96.02	-0.03%	3,400,000	$95.81	-0.10%	0		
2/12/2015	2,030,000	$96.19	0.17%	1,884,000	$96.10	0.30%	0		
2/13/2015	4,000,000	$96.20	0.02%	25,000	$96.08	-0.03%	200,000	$97.13	
2/17/2015	1,000,000	$96.10	-0.11%	0			95,000	$97.25	0.13%
2/18/2015	9,100,000	$96.27	0.17%	3,000,000	$95.88		0		
2/19/2015	100,000	$96.07	-0.20%	750,000	$96.13	0.26%	850,000	$97.50	
2/20/2015	2,210,000	$96.25	0.19%	0			620,000	$97.38	-0.13%
2/23/2015	259,000	$96.54	0.29%	0			3,100,000	$97.86	0.50%
2/24/2015	200,000	$96.54	0.00%	4,740,000	$95.98		0		
2/25/2015	1,000,000	$96.81	0.29%	600,000	$95.75	-0.24%	840,000	$97.86	
2/26/2015	0			0			20,000	$99.24	1.40%
2/27/2015	11,170,000	$97.61		1,500,000	$96.46		700,000	$98.13	-1.13%
3/2/2015	15,620,000	$98.28	0.68%	6,960,000	$97.36	0.93%	2,120,000	$98.68	0.56%
3/3/2015	0			1,000,000	$97.00	-0.37%	0		
3/4/2015	3,250,000	$97.64		3,550,000	$96.73	-0.28%	2,130,000	$98.15	
3/5/2015	1,400,000	$97.54	-0.10%	1,000,000	$96.63	-0.10%	1,180,000	$98.18	0.03%
3/6/2015	3,250,000	$97.32	-0.22%	500,000	$97.00	0.38%	1,000,000	$97.75	-0.44%
3/9/2015	3,180,000	$96.92	-0.41%	810,000	$96.51	-0.50%	41,000	$96.52	-1.26%
3/10/2015	1,171,000	$96.10	-0.85%	0			230,000	$97.50	1.01%
3/11/2015	2,010,000	$96.63	0.54%	1,000,000	$96.50		1,040,000	$97.25	-0.26%
3/12/2015	2,718,000	$96.80	0.18%	1,000,000	$96.50	0.00%	2,000,000	$97.44	0.19%
3/13/2015	1,020,000	$96.75	-0.05%	0			0		
3/16/2015	2,650,000	$97.07	0.32%	100,000	$96.63		100,000	$97.65	
3/17/2015	500,000	$96.88	-0.20%	1,000,000	$96.75	0.13%	0		
3/18/2015	2,843,000	$97.13	0.26%	0			500,000	$97.63	
3/19/2015	3,090,000	$97.49	0.37%	170,000	$96.50		0		
3/20/2015	4,765,000	$97.21	-0.28%	40,000	$97.67	1.20%	0		
3/23/2015	310,000	$97.13	-0.08%	36,000	$96.44	-1.26%	0		
3/24/2015	3,500,000	$97.16	0.03%	760,000	$96.95	0.53%	2,050,000	$97.12	
3/25/2015	700,000	$97.32	0.16%	100,000	$96.63	-0.34%	1,000,000	$97.50	0.39%
3/26/2015	1,168,000	$97.43	0.11%	0			250,000	$97.50	0.00%
3/27/2015	3,000,000	$96.96	-0.48%	0			0		
3/30/2015	2,788,000	$97.04	0.08%	0			2,080,000	$97.28	
3/31/2015	5,005,000	$97.15	0.12%	1,000,000	$96.88		2,000,000	$97.13	-0.16%
4/1/2015	4,000,000	$97.32	0.17%	0			2,055,000	$97.13	0.01%
4/2/2015	1,005,000	$97.32	0.00%	3,500,000	$96.58		9,750,000	$97.28	0.15%
4/6/2015	2,919,000	$97.25	-0.07%	2,265,000	$96.75	0.18%	4,000,000	$97.02	-0.27%
4/7/2015	1,302,000	$97.45	0.21%	4,115,000	$96.98	0.24%	5,004,000	$97.33	0.32%
4/8/2015	7,650,000	$97.69	0.25%	3,000,000	$96.75	-0.24%	4,400,000	$97.32	-0.01%
4/9/2015	1,000,000	$97.75	0.06%	140,000	$97.40	0.67%	2,000,000	$97.44	0.12%

Appendix D-3
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Exchange Notes
October 14, 2014 to October 15, 2015

	QAB Notes			QAD Notes			QAF Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
4/10/2015	0			0			0		
4/13/2015	3,000,000	$98.00		2,000,000	$96.72		0		
4/14/2015	0			500,000	$96.72	0.00%	4,800,000	$97.63	
4/15/2015	3,615,000	$97.96		0			1,235,000	$97.62	-0.01%
4/16/2015	4,500,000	$98.07	0.11%	0			1,000,000	$97.88	0.26%
4/17/2015	2,807,000	$98.08	0.02%	1,265,000	$96.68		100,000	$99.00	1.14%
4/20/2015	4,268,000	$98.17	0.09%	1,030,000	$97.03	0.36%	1,000,000	$98.00	-1.01%
4/21/2015	7,000,000	$98.01	-0.17%	550,000	$96.57	-0.47%	2,000,000	$97.81	-0.19%
4/22/2015	2,100,000	$97.89	-0.12%	1,000,000	$96.62	0.04%	0		
4/23/2015	750,000	$97.91	0.02%	890,000	$96.53	-0.09%	3,000,000	$98.08	
4/24/2015	2,145,000	$97.84	-0.07%	1,010,000	$96.37	-0.16%	1,000,000	$98.38	0.30%
4/27/2015	1,000,000	$98.00	0.17%	0			3,000,000	$98.27	-0.11%
4/28/2015	1,250,000	$97.81	-0.19%	500,000	$96.75		5,000,000	$98.33	0.06%
4/29/2015	5,000,000	$97.88	0.07%	4,200,000	$96.86	0.11%	3,100,000	$98.34	0.01%
4/30/2015	1,800,000	$97.75	-0.13%	2,000,000	$96.88	0.02%	500,000	$98.31	-0.02%
5/1/2015	1,060,000	$97.90	0.15%	2,000,000	$96.88	0.00%	0		
5/4/2015	3,344,000	$98.11	0.22%	0			246,000	$98.80	
5/5/2015	250,000	$98.00	-0.12%	68,000	$96.50		650,000	$98.24	-0.56%
5/6/2015	560,000	$97.67	-0.33%	210,000	$96.50	0.00%	0		
5/7/2015	1,250,000	$97.78	0.10%	4,100,000	$96.56	0.06%	2,000,000	$98.69	
5/8/2015	3,800,000	$97.98	0.21%	1,015,000	$96.87	0.32%	0		
5/11/2015	3,270,000	$97.98	0.00%	4,000,000	$96.81	-0.06%	0		
5/12/2015	2,950,000	$97.89	-0.09%	4,175,000	$96.77	-0.05%	54,000	$98.47	
5/13/2015	560,000	$97.89	0.00%	1,000,000	$96.88	0.11%	1,000,000	$99.00	0.54%
5/14/2015	2,228,000	$98.06	0.18%	500,000	$96.94	0.07%	250,000	$99.00	0.00%
5/15/2015	560,000	$97.97	-0.09%	0			0		
5/18/2015	10,000	$97.26	-0.72%	1,000,000	$96.87		0		
5/19/2015	1,875,000	$98.11	0.87%	1,193,000	$96.78	-0.10%	1,250,000	$99.08	
5/20/2015	2,250,000	$98.03	-0.09%	500,000	$97.01	0.24%	0		
5/21/2015	0			600,000	$96.95	-0.06%	50,000	$99.50	
5/22/2015	1,000,000	$97.76		0			0		
5/26/2015	200,000	$98.00	0.24%	760,000	$96.76		0		
5/27/2015	1,000,000	$98.00	0.00%	1,000,000	$96.88	0.12%	0		
5/28/2015	1,100,000	$97.93	-0.07%	0			0		
5/29/2015	3,000,000	$97.83	-0.10%	1,525,000	$96.83		1,000,000	$99.00	
6/1/2015	577,000	$98.18	0.35%	0			150,000	$99.25	0.25%
6/2/2015	1,050,000	$97.78	-0.41%	50,000	$97.00		0		
6/3/2015	1,240,000	$97.98	0.21%	0			1,263,000	$98.68	
6/4/2015	1,630,000	$97.82	-0.16%	0			0		
6/5/2015	2,325,000	$97.75	-0.08%	0			12,000	$98.20	
6/8/2015	4,090,000	$97.49	-0.26%	0			0		
6/9/2015	1,200,000	$97.31	-0.18%	0			1,000,000	$98.38	
6/10/2015	540,000	$97.32	0.01%	0			0		
6/11/2015	2,270,000	$97.45	0.13%	2,000,000	$96.52		0		
6/12/2015	874,000	$97.59	0.14%	50,000	$96.50	-0.02%	1,000,000	$98.38	
6/15/2015	1,805,000	$97.49	-0.10%	4,000,000	$95.51	-1.04%	800,000	$98.38	0.00%
6/16/2015	1,045,000	$98.27	0.80%	155,000	$95.88	0.39%	168,000	$97.75	-0.63%
6/17/2015	204,000	$97.53	-0.76%	300,000	$95.51	-0.38%	2,000,000	$98.76	1.02%
6/18/2015	2,000,000	$97.25	-0.29%	1,050,000	$95.52	0.01%	0		
6/19/2015	4,080,000	$97.28	0.03%	0			0		
6/22/2015	2,280,000	$97.25	-0.03%	4,600,000	$95.50		0		
6/23/2015	1,380,000	$97.45	0.21%	2,420,000	$95.60	0.11%	80,000	$97.11	
6/24/2015	1,025,000	$97.38	-0.07%	1,000,000	$95.45	-0.16%	0		
6/25/2015	40,000	$97.62	0.24%	3,580,000	$95.29	-0.17%	1,000,000	$97.63	
6/26/2015	2,010,000	$97.42	-0.21%	0			0		
6/29/2015	2,013,000	$97.07	-0.36%	0			0		
6/30/2015	860,000	$97.28	0.22%	0			450,000	$97.21	
7/1/2015	0			1,240,000	$95.15		4,000,000	$96.81	-0.41%
7/2/2015	4,100,000	$97.39		1,000,000	$95.50	0.36%	0		
7/6/2015	2,065,000	$97.44	0.06%	800,000	$95.48	-0.02%	1,000,000	$96.75	

Appendix D-3
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Exchange Notes
October 14, 2014 to October 15, 2015

	QAB Notes			QAD Notes			QAF Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
7/7/2015	1,585,000	$97.36	-0.09%	0			0		
7/8/2015	30,000	$97.99	0.65%	0			1,027,000	$96.57	
7/9/2015	2,050,000	$97.45	-0.55%	1,000,000	$95.13		750,000	$97.00	0.45%
7/10/2015	4,846,000	$97.55	0.10%	0			0		
7/13/2015	8,980,000	$97.82	0.28%	2,000,000	$95.25		0		
7/14/2015	2,220,000	$98.01	0.20%	2,100,000	$95.34	0.10%	0		
7/15/2015	4,552,000	$98.05	0.04%	1,200,000	$95.52	0.19%	0		
7/16/2015	1,020,000	$98.24	0.19%	1,005,000	$95.69	0.18%	40,000	$96.75	
7/17/2015	0			1,100,000	$95.68	-0.01%	0		
7/20/2015	2,400,000	$98.11		1,800,000	$95.89	0.22%	0		
7/21/2015	3,075,000	$98.07	-0.04%	475,000	$95.57	-0.34%	675,000	$97.34	
7/22/2015	5,100,000	$97.99	-0.08%	0			0		
7/23/2015	4,500,000	$98.08	0.09%	1,000,000	$95.68		1,000,000	$97.38	
7/24/2015	1,500,000	$97.93	-0.15%	0			100,000	$97.25	-0.13%
7/27/2015	4,500,000	$97.83	-0.10%	20,000	$97.77		0		
7/28/2015	1,048,000	$97.86	0.03%	68,000	$95.58	-2.27%	2,075,000	$96.62	
7/29/2015	0			2,000,000	$95.65	0.08%	39,000	$96.10	-0.55%
7/30/2015	100,000	$98.51		1,000,000	$95.66	0.01%	45,000	$96.00	-0.10%
7/31/2015	460,000	$97.84	-0.68%	1,655,000	$95.67	0.01%	100,000	$97.59	1.64%
8/3/2015	200,000	$97.42	-0.43%	1,000,000	$95.50	-0.18%	0		
8/4/2015	1,080,000	$98.11	0.70%	1,000,000	$95.50	0.00%	0		
8/5/2015	5,020,000	$98.00	-0.12%	1,000,000	$96.00	0.52%	0		
8/6/2015	4,710,000	$98.36	0.37%	2,750,000	$96.02	0.02%	0		
8/7/2015	4,250,000	$98.30	-0.06%	3,000,000	$96.21	0.19%	0		
8/10/2015	1,600,000	$98.69	0.39%	2,000,000	$95.25	-1.00%	0		
8/11/2015	0			2,100,000	$95.22	-0.03%	500,000	$96.50	
8/12/2015	0			1,420,000	$96.05	0.87%	120,000	$97.00	0.52%
8/13/2015	0			0			0		
8/14/2015	132,000	$98.28		205,000	$95.98		1,000,000	$96.25	
8/17/2015	1,000,000	$98.88	0.60%	1,500,000	$96.00	0.02%	0		
8/18/2015	340,000	$98.34	-0.54%	0			0		
8/19/2015	1,000,000	$99.00	0.67%	2,000,000	$96.27		1,000,000	$96.00	
8/20/2015	18,000	$97.14	-1.89%	0			350,000	$95.89	-0.11%
8/21/2015	2,381,000	$98.00	0.88%	0			0		
8/24/2015	3,878,000	$97.54	-0.48%	3,310,000	$95.46		1,000,000	$95.00	
8/25/2015	2,000,000	$97.80	0.27%	0			500,000	$94.98	-0.02%
8/26/2015	885,000	$97.60	-0.20%	500,000	$96.00		0		
8/27/2015	208,000	$96.46	-1.17%	0			0		
8/28/2015	0			4,060,000	$96.20		0		
8/31/2015	0			450,000	$96.36	0.17%	1,000,000	$96.00	
9/1/2015	0			815,000	$96.50	0.14%	0		
9/2/2015	500,000	$98.24		1,015,000	$94.95	-1.62%	0		
9/3/2015	15,000	$97.77	-0.48%	280,000	$96.50	1.62%	2,000,000	$95.86	
9/4/2015	0			0			0		
9/8/2015	260,000	$98.13		1,350,000	$96.73		600,000	$96.34	
9/9/2015	0			30,000	$97.25	0.53%	2,232,000	$96.70	0.37%
9/10/2015	0			2,000,000	$96.54	-0.74%	3,123,000	$96.91	0.22%
9/11/2015	126,000	$98.50		0			1,000,000	$96.75	-0.17%
9/14/2015	0			0			0		
9/15/2015	500,000	$98.75		1,000,000	$97.00		0		
9/16/2015	0			0			0		
9/17/2015	0			0			0		
9/18/2015	150,000	$98.88		0			0		
9/21/2015	0			0			0		
9/22/2015	70,000	$99.01		1,180,000	$96.65		3,000,000	$97.19	
9/23/2015	600,000	$98.50	-0.51%	0			0		
9/24/2015	0			0			2,000,000	$97.06	
9/25/2015	0			110,000	$96.44		0		
9/28/2015	3,000,000	$98.29		20,000	$96.50	0.06%	0		
9/29/2015	4,425,000	$98.06	-0.23%	500,000	$95.26	-1.30%	4,000	$95.88	

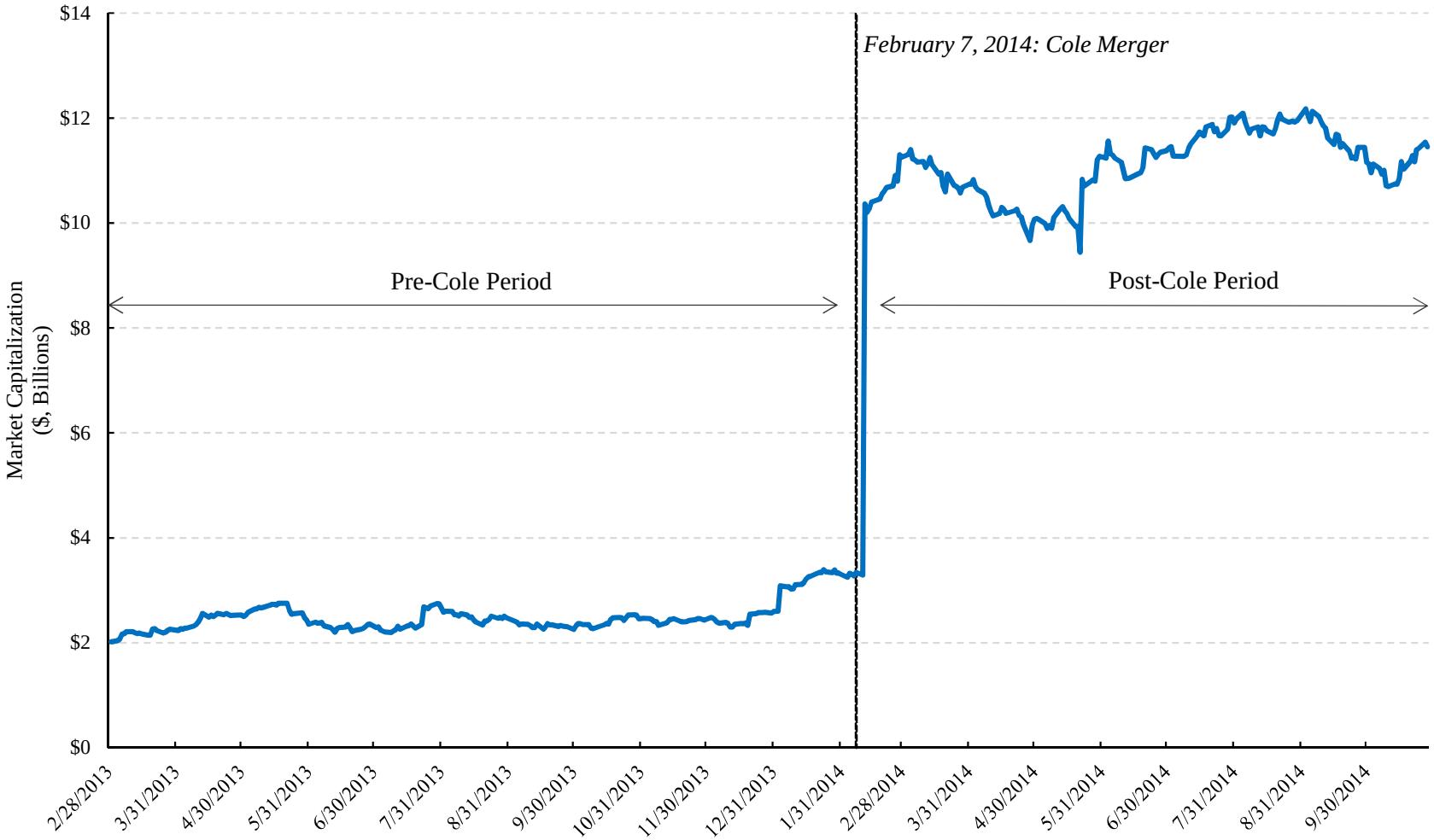
Appendix D-3
Volume, VWAP, and Log Returns after Corrected TRACE Data Treatment
Exchange Notes
October 14, 2014 to October 15, 2015

	QAB Notes			QAD Notes			QAF Notes		
Date	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return	Volume	VWAP	1-Day Log Return
9/30/2015	0			445,000	$95.56	0.32%	0		
10/1/2015	265,000	$98.00		0			0		
10/2/2015	2,503,000	$98.21	0.21%	1,500,000	$96.16		0		
10/5/2015	7,150,000	$98.41	0.21%	1,100,000	$96.57	0.42%	0		
10/6/2015	2,625,000	$98.69	0.29%	2,316,000	$96.58	0.01%	1,328,000	$96.50	
10/7/2015	2,625,000	$98.96	0.27%	80,000	$96.31	-0.28%	60,000	$95.18	-1.37%
10/8/2015	2,000,000	$99.04	0.09%	0			0		
10/9/2015	0			2,000,000	$97.25		15,000	$96.31	
10/12/2015	0			0			0		
10/13/2015	2,996,000	$98.65		1,280,000	$96.41		820,000	$96.69	
10/14/2015	1,000,000	$98.50	-0.15%	0			1,000,000	$97.13	0.45%
10/15/2015	0			0			20,000	$96.33	-0.82%

Source: FINRA TRACE data, FINRA0000001-007, FINRA0000014.

Notes:
[1] Values are calculated after correcting Dr. Feinstein's organization of the TRACE data, as described in Section VI.B-C.
[2] Volume and VWAP include trades that occur before 9:30AM and after 4:00PM.

Exhibit 1
ARCP's Market Capitalization during the Relevant Class Period
February 28, 2013 to October 28, 2014



Source: Bloomberg.

Exhibit 2A
ARCP Common Stock Statistical Tests on Dr. Feinstein's 8-K Event Dates
Based on Dr. Feinstein's Interval-1 and Interval-2 Regression Results

	Pre-Cole Period[2],[3]	**Post-Cole Period**[3]
Period Start Date	2/28/2013	2/7/2014
Period End Date	2/6/2014	10/29/2014
Number of Days	238	184
Significant Days	20	13
News Days[1]	25	14
Significant News Days	4	7
Non-News Days	213	170
Significant Non-News Days	16	6
Proportion of News Days that are Significant	16.0%	50.0%
Proportion of Non-News Days that are Significant	7.5%	3.5%
Z-Score (Pooled Variance)[4]	1.45	6.52
P-Value (One-Sided)	0.074	0.000
Statistically Significant?	**No**	Yes
Z-Score (Unpooled Variance)[5]	1.12	3.46
P-Value (One-Sided)	0.130	0.000
Statistically Significant?	**No**	Yes
Fisher's Exact Test[6]		
P-Value (One-Sided)	0.143	0.000
Statistically Significant?	**No**	Yes

Source:
[A] Feinstein Report, Exhibit-6, Exhibit-8a, Exhibit-8b, and Exhibit-8c.

Notes:
[1] News days are the effective dates listed in Feinstein Report, Exhibit-6.
[2] Relies on Dr. Feinstein's "Interval-1" event study regression results from Feinstein Report, Exhibit-8b for all dates through August 19, 2013.
[3] Relies on Dr. Feinstein's "Interval-2" event study regression results from Feinstein Report, Exhibit-8c for all dates on and after August 20, 2013.
[4] The Z-Score (Pooled Variance) test reproduces Dr. Feinstein's approach (Feinstein Report, Exhibit-10). It estimates the statistical significance of the difference in the proportions of significant events on news and non-news days, under the assumption that the variability in these groups is the same.
[5] The Z-Score (Unpooled Variance) estimates the statistical significance in the proportions of significant events on news and non-news days, allowing for different variability on news and non-news days.
[6] Fisher's Exact Test estimates the exact probability of generating the numbers of significant/insignificant news/non-news days reported in each column.

Exhibit 2B

ARCP Common Stock Statistical Tests on Dr. Feinstein's 8-K Event Dates

Based on Separate Regression Estimation Periods: Pre-Cole Period and Post-Cole Period

	Pre-Cole Period[2]	**Post-Cole Period**[2]
Period Start Date	2/28/2013	2/7/2014
Period End Date	2/6/2014	10/29/2014
Number of Days	238	184
Significant Days	11	17
News Days[1]	25	14
Significant News Days	4	8
Non-News Days	213	170
Significant Non-News Days	7	9
Proportion of News Days that are Significant	16.0%	57.1%
Proportion of Non-News Days that are Significant	3.3%	5.3%
Z-Score (Pooled Variance)[3]	2.86	6.44
P-Value (One-Sided)	0.002	0.000
Statistically Significant?	Yes	Yes
Z-Score (Unpooled Variance)[4]	1.71	3.89
P-Value (One-Sided)	0.044	0.000
Statistically Significant?	Yes	Yes
Fisher's Exact Test[5]		
P-Value (One-Sided)	0.019	0.000
Statistically Significant?	Yes	Yes

Sources:

[A] Feinstein Report, Exhibit-6, Exhibit-8a, Exhibit-8b, and Exhibit-8c.

[B] "Feinstein Exhibit Stack (SF0033381).xlsx," tab "Common ES."

Notes:

[1] News days are the effective dates listed in Feinstein Report, Exhibit-6.

[2] Regressions use data from the "Common ES" tab in "Feinstein Exhibit Stack (SF0033381).xlsx" and use Dr. Feinstein's market index, peer index, and indicator variables for each of the 8-K Event Dates. A separate regression is run for each period.

[3] The Z-Score (Pooled Variance) test reproduces Dr. Feinstein's approach (Feinstein Report, Exhibit-10). It estimates the statistical significance of the difference in the proportions of significant events on news and non-news days, under the assumption that the variability in these groups is the same.

[4] The Z-Score (Unpooled Variance) estimates the statistical significance in the proportions of significant events on news and non-news days, allowing for different variability on news and non-news days.

[5] Fisher's Exact Test estimates the exact probability of generating the numbers of significant/insignificant news/non-news days reported in each column.

Exhibit 2C

ARCP Common Stock Statistical Tests on Dr. Feinstein's 8-K Event Dates

Based on One Regression Estimation Period Covering the Relevant Class Period, with Indicator Variable for Pre-Cole/Post-Cole Period

	Pre-Cole Period[2]	**Post-Cole Period**[2]
Period Start Date	2/28/2013	2/7/2014
Period End Date	2/6/2014	10/29/2014
Number of Days	238	184
Significant Days	20	12
News Days[1]	25	14
Significant News Days	5	7
Non-News Days	213	170
Significant Non-News Days	15	5
Proportion of News Days that are Significant	20.0%	50.0%
Proportion of Non-News Days that are Significant	7.0%	2.9%
Z-Score (Pooled Variance)[3]	2.21	6.85
P-Value (One-Sided)	0.014	0.000
Statistically Significant?	Yes	Yes
Z-Score (Unpooled Variance)[4]	1.58	3.51
P-Value (One-Sided)	0.057	0.000
Statistically Significant?	**No**	Yes
Fisher's Exact Test[5]		
P-Value (One-Sided)	0.044	0.000
Statistically Significant?	Yes	Yes

Sources:

[A] Feinstein Report, Exhibit-6, Exhibit-8a, Exhibit-8b, and Exhibit-8c.

[B] "Feinstein Exhibit Stack (SF0033381).xlsx," tab "Common ES."

Notes:

[1] News days are the effective dates listed in Feinstein Report, Exhibit-6.

[2] Regression uses data from the "Common ES" tab in "Feinstein Exhibit Stack (SF0033381).xlsx" and uses Dr. Feinstein's market index, peer index, and indicator variables for each of the 8-K Event Dates. In addition, the regression includes an indicator variable that equals 1 on dates in the Post-Cole Period, and 0 otherwise.

[3] The Z-Score (Pooled Variance) test reproduces Dr. Feinstein's approach (Feinstein Report, Exhibit-10). It estimates the statistical significance of the difference in the proportions of significant events on news and non-news days, under the assumption that the variability in these groups is the same.

[4] The Z-Score (Unpooled Variance) estimates the statistical significance in the proportions of significant events on news and non-news days, allowing for different variability on news and non-news days.

[5] Fisher's Exact Test estimates the exact probability of generating the numbers of significant/insignificant news/non-news days reported in each column.

Exhibit 3A
ARCP Common Stock Statistical Tests on All 8-K Event Dates
Based on Dr. Feinstein's Interval-1 and Interval-2 Regression Results

	Pre-Cole Period[2]	Post-Cole Period[3]
Period Start Date	2/28/2013	2/7/2014
Period End Date	2/6/2014	10/29/2014
Number of Days	238	184
Significant Days	22	14
News Days[1]	97	52
Significant News Days	10	11
Non-News Days	141	132
Significant Non-News Days	12	3
Proportion of News Days that are Significant	10.3%	21.2%
Proportion of Non-News Days that are Significant	8.5%	2.3%
Z-Score (Pooled Variance)[4]	0.47	4.35
P-Value (One-Sided)	0.319	0.000
Statistically Significant?	**No**	Yes
Z-Score (Unpooled Variance)[5]	0.46	3.25
P-Value (One-Sided)	0.321	0.001
Statistically Significant?	**No**	Yes
Fisher's Exact Test[6]		
P-Value (One-Sided)	0.400	0.000
Statistically Significant?	**No**	Yes

Source:
[A] Feinstein Report, Exhibit-5, Exhibit-8a, Exhibit-8b, and Exhibit-8c.

Notes:
[1] News days are the effective dates listed in the Feinstein Report, Exhibit-5. Feinstein Report, Exhibit-5 incorrectly identified the effective dates as the next trading day instead of the current trading day for the following 8-K filing dates: April 22, April 24, May 8, July 23, 2013; and May 23, October 23, 2014. I have corrected this mistake in the table above.
[2] Relies on Dr. Feinstein's "Interval-1" event study regression results from Feinstein Report, Exhibit-8b for all dates through August 19, 2013.
[3] Relies on Dr. Feinstein's "Interval-2" event study regression results from Feinstein Report, Exhibit-8c for all dates on and after August 20, 2013.
[4] The Z-Score (Pooled Variance) test reproduces Dr. Feinstein's approach (Feinstein Report, Exhibit-10). It estimates the statistical significance of the difference in the proportions of significant events on news and non-news days, under the assumption that the variability in these groups is the same.
[5] The Z-Score (Unpooled Variance) estimates the statistical significance in the proportions of significant events on news and non-news days, allowing for different variability on news and non-news days.
[6] Fisher's Exact Test estimates the exact probability of generating the numbers of significant/insignificant news/non-news days reported in each column.

Exhibit 3B
ARCP Common Stock Statistical Tests on All 8-K Event Dates
Based on Separate Regression Estimation Periods: Pre-Cole Period and Post-Cole Period

	Pre-Cole Period[2]	Post-Cole Period[2]
Period Start Date	2/28/2013	2/7/2014
Period End Date	2/6/2014	10/29/2014
Number of Days	238	184
Significant Days	13	18
News Days[1]	97	52
Significant News Days	7	13
Non-News Days	141	132
Significant Non-News Days	6	5
Proportion of News Days that are Significant	7.2%	25.0%
Proportion of Non-News Days that are Significant	4.3%	3.8%
Z-Score (Pooled Variance)[3]	0.99	4.36
P-Value (One-Sided)	0.162	0.000
Statistically Significant?	**No**	Yes
Z-Score (Unpooled Variance)[4]	0.95	3.40
P-Value (One-Sided)	0.172	0.000
Statistically Significant?	**No**	Yes
Fisher's Exact Test[5]		
P-Value (One-Sided)	0.241	0.000
Statistically Significant?	**No**	Yes

Sources:
[A] Feinstein Report, Exhibit-5, Exhibit-8a, Exhibit-8b, and Exhibit-8c.
[B] "Feinstein Exhibit Stack (SF0033381).xlsx," tab "Common ES."

Notes:
[1] News days are the effective dates listed in the Feinstein Report, Exhibit-5. Feinstein Report, Exhibit-5 incorrectly identified the effective dates as the next trading day instead of the current trading day for the following 8-K filing dates: April 22, April 24, May 8, July 23, 2013; and May 23, October 23, 2014. I have corrected this mistake in the table above.
[2] Regressions use data from the "Common ES" tab in "Feinstein Exhibit Stack (SF0033381).xlsx" and use Dr. Feinstein's market index, peer index, indicator variables for each of the 8-K Event Dates listed in the corrected version of Feinstein Report, Exhibit-5. A separate regression is run for each period.
[3] The Z-Score (Pooled Variance) test reproduces Dr. Feinstein's approach (Feinstein Report, Exhibit-10). It estimates the statistical significance of the difference in the proportions of significant events on news and non-news days, under the assumption that the variability in these groups is the same.
[4] The Z-Score (Unpooled Variance) estimates the statistical significance in the proportions of significant events on news and non-news days, allowing for different variability on news and non-news days.
[5] Fisher's Exact Test estimates the exact probability of generating the numbers of significant/insignificant news/non-news days reported in each column.

Exhibit 3C

ARCP Common Stock Statistical Tests on All 8-K Event Dates

Based on One Regression Estimation Period Covering the Relevant Class Period, with Indicator Variable for Pre-Cole/Post-Cole Period

	Pre-Cole Period[2]	**Post-Cole Period**[2]
Period Start Date	2/28/2013	2/7/2014
Period End Date	2/6/2014	10/29/2014
Number of Days	238	184
Significant Days	24	13
News Days[1]	97	52
Significant News Days	12	11
Non-News Days	141	132
Significant Non-News Days	12	2
Proportion of News Days that are Significant	12.4%	21.2%
Proportion of Non-News Days that are Significant	8.5%	1.5%
Z-Score (Pooled Variance)[3]	0.97	4.68
P-Value (One-Sided)	0.166	0.000
Statistically Significant?	**No**	Yes
Z-Score (Unpooled Variance)[4]	0.94	3.41
P-Value (One-Sided)	0.172	0.000
Statistically Significant?	**No**	Yes
Fisher's Exact Test[5]		
P-Value (One-Sided)	0.225	0.000
Statistically Significant?	**No**	Yes

Sources:

[A] Feinstein Report, Exhibit-5, Exhibit-8a, Exhibit-8b, and Exhibit-8c.

[B] "Feinstein Exhibit Stack (SF0033381).xlsx," tab "Common ES."

Notes:

[1] News days are the effective dates listed in the Feinstein Report, Exhibit-5. Feinstein Report, Exhibit-5 incorrectly identified the effective dates as the next trading day instead of the current trading day for the following 8-K filing dates: April 22, April 24, May 8, July 23, 2013; and May 23, October 23, 2014. I have corrected this mistake in the table above.

[2] Regression uses data from the "Common ES" tab in "Feinstein Exhibit Stack (SF0033381).xlsx" and uses Dr. Feinstein's market index, peer index, and indicator variables for each of the 8-K Event Dates listed in the corrected version of Feinstein Report, Exhibit-5. In addition, the regression includes an indicator variable that equals 1 on dates in the Post-Cole Period, and 0 otherwise.

[3] The Z-Score (Pooled Variance) test reproduces Dr. Feinstein's approach (Feinstein Report, Exhibit-10). It estimates the statistical significance of the difference in the proportions of significant events on news and non-news days, under the assumption that the variability in these groups is the same.

[4] The Z-Score (Unpooled Variance) estimates the statistical significance in the proportions of significant events on news and non-news days, allowing for different variability on news and non-news days.

[5] Fisher's Exact Test estimates the exact probability of generating the numbers of significant/insignificant news/non-news days reported in each column.

Exhibit 4

ARCP Common Stock Statistical Tests on Earnings Event Dates

	Relevant Class Period[2]	Relevant Jet Capital Period[2]
Period Start Date	2/28/2013	2/27/2014
Period End Date	10/29/2014	10/28/2014
Number of Days	421	170
Significant Days	24	8
Earnings Announcement Days[1]	7	3
Significant Earnings Announcement Days	2	1
Non-Earnings Announcement Days	414	167
Significant Non-Earnings Announcement Days	22	7
Insignificant Earnings Days	5	2
Insignificant Non-Earnings Days	392	160
Proportion of Earnings Announcement Days that are Significant	28.6%	33.3%
Proportion of Non-Earnings Announcement Days that are Significant	5.3%	4.2%
Z-Score (Pooled Variance)[3]	2.63	2.20
P-Value (One-Sided)	0.004	0.014
Statistically Significant?	Yes	Yes
Z-Score (Unpooled Variance)[4]	1.36	1.05
P-Value (One-Sided)	0.087	0.147
Statistically Significant?	No	No
Fisher's Exact Test[5]		
P-Value (One-Sided)	0.055	0.135
Statistically Significant?	No	No

Sources:

[A] Feinstein Report, Exhibit-6, Exhibit-8a, Exhibit-8b, and Exhibit-8c.
[B] "Feinstein Exhibit Stack (SF0033381).xlsx," tab "Common ES."
[C] Nye Report, Exhibit 11A.

Notes:

[1] Earnings announcement dates are February 23, May 6, August 6, and November 7, 2013; and February 27, May 8, and July 29, 2014.
[2] Regression for the Relevant Class Period column uses data from the "Common ES" tab in "Feinstein Exhibit Stack (SF0033381).xlsx." Dr. Feinstein's regression specifications are applied to the Relevant Class Period, with 10/29/2014 dropped from the regression. The Relevant Jet Capital Period relies on event study regression results from Nye Report, Exhibit 11A.
[3] The Z-Score (Pooled Variance) test reproduces Dr. Feinstein's approach (Feinstein Report, Exhibit-10). It estimates the statistical significance of the difference in the proportions of significant events on earnings and non-earnings announcement days, under the assumption that the variability in these groups is the same.
[4] The Z-Score (Unpooled Variance) estimates the statistical significance in the proportions of significant events on earnings and non-earnings announcement days, allowing for different variability on earnings and non-earnings announcement days.
[5] Fisher's Exact Test estimates the exact probability of generating the numbers of significant/insignificant earnings/non-earnings announcement days reported in each column.

Exhibit 5

Excess Returns of a Y-Filter Trading Rule Strategy for ARCP Common Stocks

			Y-Filter[1]						Buy-and-Hold Return[5]	Percentage of Y-Filters That Beat Buy-and-Hold
			1.0%	1.5%	2.0%	2.5%	3.0%	3.5%		
	Post-Cole Period									
[A]	February 7, 2014 to October 28, 2014	*Return* [6]	-3.1%	-3.1%	10.3%	3.0%	-4.2%	1.9%	-7.1%	100%
		Excess Return [7]	4.0%	4.0%	17.4%	10.1%	2.9%	9.0%		
		Number of trades [8]	48	30	16	14	12	9		
	Relevant Jet Capital Period									
[B]	February 27, 2014 to October 28, 2014	*Return* [6]	-9.6%	-8.7%	7.5%	2.8%	-4.5%	1.2%	-11.9%	100%
		Excess Return [7]	2.2%	3.1%	19.3%	14.6%	7.3%	13.0%		
		Number of trades [8]	46	28	14	12	10	8		

Sources:

[A] Bloomberg.

[B] *See* Eugene F. Fama and Marshall E. Blume, "Filter Rules and Stock-Market Trading," *The Journal of Business*, Vol. 39, No. 1, 1966, pp. 226-241.

Notes:

[1] The Y-Filter is an investment strategy whereby an investor takes a long or a short position in a stock based on the stock price's deviation from a reference price. The investor buys if the stock price increases by at least *y* % from the last lowest price, and sells when the price decreases by at least *y* % from the last highest price. The table presents the returns of this strategy under different values for *y* : 1.0%, 1.5%, 2.0%, 2.5%, 3.0%, 3.5%.

[2] The closing price on the day a position is first opened initially defines the reference price: a peak in the case of a long (*i.e.* , buy) transaction and a trough in the case of a short (*i.e.* , sell) transaction. On subsequent days, if the position is not closed, the reference price may be replaced with a new value: for a long position, the current price will become a new reference price if it is above the last peak. Similarly, for a short position, the current price will replace the reference price if it is below the last trough.

[3] Each time the Y-Filter tells the investor to close a long position and sell, the investor shorts the number of shares equal to the number of shares in his current long position, and holds a cash position equal to the value of the shorted shares. Each time the Y-Filter tells the investor to close a short position and buy, the investor goes long the number of shares equal in market value to his current short position.

[4] The last time during the period that the Y-Filter tells the investor to close either a long or a short position, the investor sells or buys the number of shares equal to his current outstanding position to end the day with no open position.

[5] Buy-and-Hold Return represents the return on a passive long position during the period.

[6] Return represents the total return on the Y-Filter strategy during the period.

[7] Excess Return is the difference between Return and Buy-and-Hold Return.

[8] Number of Trades is the number of trades that an investor would have to perform to implement the Y-Filter strategy.

[9] Returns are calculated assuming dividends are reinvested.

[10] Analysis assumes transaction costs of $10 per trade and an initial investment of 1,000 shares (long or short). If the first position is a short, a cash position equal to 1,000 shares will be held in addition to the short position.

[11] October 29, 2014 is excluded from both the Buy-and-Hold strategy and the Y-Filter strategy.

Exhibit 6
Average Weekly Turnover of the ARCP Notes
Relevant Class Period: February 28, 2013 to October 29, 2014

		Feinstein Table-4		Corrected TRACE Data					
	Face Value[1]	Average Weekly Volume[2]	Average Weekly Turnover[1],[4]	Average Weekly Volume[2]	Dr. Feinstein's Volume Overstatement[3]	Average Weekly Turnover[4]	Number of Weeks in Relevant Class Period[5]	% Weeks below 2% Turnover	% Weeks below 1% Turnover
TAA Notes[6]	$597,500,000	$23,159,849	3.88%	$18,902,343	22.5%	4.24%	65	43%	25%
TAB Notes	$402,500,000	$14,728,034	3.66%	$11,619,888	26.7%	2.89%	45	49%	20%
QAA Notes	$1,300,000,000	$15,828,549	1.22%	$12,026,925	31.6%	0.93%	35	91%	57%
QAC Notes	$750,000,000	$15,080,933	2.01%	$12,944,828	16.5%	1.73%	35	71%	46%
QAE Notes	$500,000,000	$12,998,782	2.60%	$9,735,256	33.5%	1.95%	35	63%	43%

Sources:
[A] Feinstein Report, ¶264, Table-4.
[B] FINRA TRACE data, FINRA0000001-007, FINRA0000014.
[C] Bloomberg.

Notes:
[1] Feinstein's Table-4 reverses the face values of the TAA Notes and the TAB Notes. I have corrected this mistake in the table above.
[2] Average weekly volume is computed as average daily volume multiplied by five.
[3] Dr. Feinstein's Volume Overstatement is the percent difference between Dr. Feinstein's average weekly volume calculation and the corrected average weekly volume calculation.
[4] Average weekly turnover is computed as average of daily turnover multiplied by five, where daily turnover equals volume divided by currently outstanding face value for the given trading day.
[5] Excludes weeks that have trading days prior to the ARCP Note's issuance or after the 144A Notes' exchange date.
[6] The TAA Notes were originally issued with a face value of $310 million. A secondary offering of $287.5 million was completed on December 10, 2013 and increased the total outstanding face value to $597.5 million. Therefore, prior to December 10, 2013, daily turnover for the TAA Notes is calculated as daily volume divided by $310 million, and after December 10, 2013 daily turnover is calculated as daily volume divided by $597.5 million. *See* ARCP Form 10-K for the year ended December 31, 2013, p. F-18.
[7] Corrected TRACE data values are calculated after correcting Dr. Feinstein's organization of the TRACE data, as described in Section VI.A. *See* Appendix D.
[8] Analysis covers the period starting from each ARCP Note's issuance date through October 29, 2014 for the Convertible Notes and through the bond exchange date for the 144A Notes.

Exhibit 7
Number of Trades per Day
Relevant Class Period: 28 February, 2013 to October 29, 2014

	TAA Notes		TAB Notes		QAA Notes		QAC Notes		QAE Notes		ARCP Common Stock	
	#	%	#	%	#	%	#	%	#	%	#	%
Total Number of Trade Days in Class Period	318		224		174		174		176		422	
Days with No Trades	37	12%	38	17%	77	44%	76	44%	92	52%	0	0%
Days with 1-5 Trades	187	59%	144	64%	94	54%	97	56%	80	45%	0	0%
Days with 6-10 Trades	68	21%	28	13%	3	2%	1	1%	4	2%	0	0%
Days with More than 10 Trades	26	8%	14	6%	0	0%	0	0%	0	0%	422	100%
Average Number of Trades per Day	**5.0**		**3.3**		**1.1**		**1.2**		**1.0**		**25,816**	

Sources:
[A] FINRA TRACE data, FINRA0000001-007, FINRA0000014.
[B] Bloomberg.

Notes:
[1] Values are calculated after correcting Dr. Feinstein's organization of the TRACE data, as described in Section VI.A. See Appendix D.
[2] Bond analysis covers the period starting from each ARCP Note's issuance date through October 29, 2014 for the Convertible Notes and through the bond exchange date for the 144A Notes.

Exhibit 8
ARCP Notes and Preferred Stock Statistical Tests on News Days

	TAA Notes	TAB Notes	QAA Notes	QAC Notes	QAE Notes	Preferred Stock
Period Start Date	7/30/2013	12/11/2013	2/7/2014	2/7/2014	2/7/2014	1/6/2014
Period End Date	10/29/2014	10/29/2014	10/10/2014	10/8/2014	10/1/2014	10/29/2014
Number of Days[1]	331	233	178	176	171	215
Number of Days Used[2]	251	151	62	59	45	206
Significant Days	9	8	4	3	1	9
News Days[3]	22	10	4	5	6	16
Significant News Days	1	2	0	0	0	1
Non-News Days	229	141	58	54	39	190
Significiant Non-News Days	8	6	4	3	1	8
Proportion of News Days that are Significant	4.5%	20.0%	0.0%	0.0%	0.0%	6.3%
Proportion of Non-News Days that are Significant	3.5%	4.3%	6.9%	5.6%	2.6%	4.2%
Z-Score (Pooled Variance)[4]	0.25	2.15	-0.54	-0.54	-0.40	0.38
P-Value (One-Sided)	0.400	0.016	0.706	0.706	0.654	0.351
Statistically Significant?	**No**	Yes	**No**	**No**	**No**	**No**
Z-Score (Unpooled Variance)[5]	0.23	1.23	-2.07	-1.78	-1.01	0.33
P-Value (One-Sided)	0.410	0.109	0.981	0.963	0.844	0.372
Statistically Significant?	**No**	**No**	**No**	**No**	**No**	**No**
Fisher's Exact Test[6]						
P-Value (One-Sided)	0.568	0.089	0.761	0.763	0.867	0.524
Statistically Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Exhibit 8
ARCP Notes and Preferred Stock Statistical Tests on News Days

Sources:

[A] "Feinstein Exhibit Stack (SF0033381).xlsx", tabs "Common ES" and "Preferred ES."

[B] Feinstein Report, Exhibit-16.

[C] VEREIT, Inc., Ratings Issuer Outlook, Moody's, available at https://www.moodys.com/credit-ratings/VEREIT-Inc-credit-rating-823613280 (accessed May 24, 2019).

Notes:

[1] Number of Days is the number of trading days between the first and last observed price.

[2] Number of Days Used in Regression is the number of trading days with a one-day price return (i.e., there is trading and price information both on the current trading day and one trading day prior).

[3] News days are the effective dates listed in Feinstein Report, Exhibit-6. In addition, January 28, 2014 is also included as a news date, corresponding to Moody's revised credit rating outlook for ARCP.

[4] For the dependent variables, the ARCP Notes regressions use the corrected TRACE data presented in Appendix D. For the independent variables, the ARCP Notes regressions use data from the "Common ES" tab and the "Exhibit-16" tab in "Feinstein Exhibit Stack (SF0033381).xlsx" and includes Dr. Feinstein's market index, peer index, benchmark bond index, and indicator variables for each of the news days. For the preferred stock regression variables, the regression uses the "Preferred ES" tab in "Feinstein Exhibit Stack (SF0033381).xlsx" and includes Dr. Feinstein's market index, peer index, preferred stock index, and indicator variables for each of the news days.

[5] The Z-Score (Pooled Variance) test reproduces Dr. Feinstein's approach (Feinstein Report, Exhibit-10). It estimates the statistical significance of the difference in the proportions of significant events on news and non-news days, under the assumption that the variability in these groups is the same.

[6] The Z-Score (Unpooled Variance) estimates the statistical significance in the proportions of significant events on news and non-news days, allowing for different variability on news and non-news days.

[7] Fisher's Exact Test estimates the exact probability of generating the numbers of significant/insignificant news/non-news days reported in each column.

Exhibit 9
P-values of Abnormal Returns on Earnings Announcement Dates and Credit Event Dates

	TAA Notes	TAB Notes	QAA Notes	QAC Notes	QAE Notes	Preferred Stock
Earnings Announcement Dates						
August 6, 2013	0.931	-	-	-	-	-
November 7, 2013	0.764	-	-	-	-	-
February 27, 2014	0.294	0.166	0.385	0.857	0.178	0.518
May 8, 2014	0.454	0.742	No Trading	0.915	0.340	0.759
July 29, 2014	0.308	0.092	0.393	0.990	0.437	0.737
Credit Event Dates						
October 23, 2013	0.252	-	-	-	-	-
January 28, 2014	0.644	No Trading	-	-	-	0.862

Exhibit 9
P-values of Abnormal Returns on Earnings Announcement Dates and Credit Event Dates

Sources:

[A] "Feinstein Exhibit Stack (SF0033381).xlsx", tabs "Common ES" and "Preferred ES."

[B] Feinstein Report, Exhibit-16.

[C] VEREIT, Inc., Ratings Issuer Outlook, Moody's, available at https://www.moodys.com/credit-ratings/VEREIT-Inc-credit-rating-823613280 (accessed May 24, 2019).

Notes:

[1] Earnings announcement dates are February 23, May 6, August 6, and November 7, 2013; and February 27, May 8, and July 29, 2014.

[2] Credit event dates are October 23, 2013 and January 28, 2014, dates on which Moody's revised ARCP's credit rating outlook. *See* Feinstein Report, Table-1.

[3] For the dependent variables, the ARCP Notes regressions use the corrected TRACE data presented in Appendix D. For the independent variables, the ARCP Notes regressions use data from the "Common ES" tab and the "Exhibit-16" tab in "Feinstein Exhibit Stack (SF0033381).xlsx" and includes Dr. Feinstein's market index, peer index, benchmark bond index, and indicator variables for each of the news days. For the preferred stock regression variables, the regression uses the "Preferred ES" tab in "Feinstein Exhibit Stack (SF0033381).xlsx" and includes Dr. Feinstein's market index, peer index, preferred stock index, and indicator variables for each of the news days. News days are the effective dates listed in Feinstein Report, Exhibit-6. In addition, January 28, 2014 is also included as a news date, corresponding to Moody's revised credit rating outlook for ARCP.

[4] The regressions include only trading days with a one-day price return (i.e., there is trading and price information both on the current trading day and one trading day prior).

[5] May 8, 2014 and July 29, 2014 for the QAC Notes do not have trading on the previous trading day and therefore do not have one-day returns. The t-statistic (and corresponding p-value) for the multi-day return on these dates is calculated by multiplying the one-day regression standard error by the square root of the number of days in the multi-day period. For example, QAC has a multi-day return of 0.12% during the four-trading-day period of May 2 to May 8, 2014. The multi-day return predicted by the regression is 0.17%, so the abnormal return is approximately 0.05%. The corresponding regression standard error is 0.24% multiplied by the square root of 4, which is equal to 0.47%. Therefore, the t-statistic is approximately 0.11. At a degree of freedom of 50, the p-value is 0.915.

[6] Blank entries correspond to trading days prior to the issuance of the given ARCP Note.

Exhibit 10

Number of Trading Days with Statistically Significant Abnormal Returns for the ARCP Notes

February 28, 2013 to October 28, 2014

Number of Trading Days[3]	163
Zero ARCP Notes with Significant Abnormal Return	148
One ARCP Note with Significant Abnormal Return	15
Two or More ARCP Notes with Significant Abnormal Return	0

Sources:

[A] "Feinstein Exhibit Stack (SF0033381).xlsx", tab "Common ES."

[B] Feinstein Report, Exhibit-16.

[C] VEREIT, Inc., Ratings Issuer Outlook, Moody's, available at https://www.moodys.com/credit-ratings/VEREIT-Inc-credit-rating-823613280 (accessed May 24, 2019).

Notes:

[1] For the dependent variables, the ARCP Notes regressions use the corrected TRACE data presented in Appendix D. For the independent variables, the ARCP Notes regressions use data from the "Common ES" tab and the "Exhibit-16" tab in "Feinstein Exhibit Stack (SF0033381).xlsx" and includes Dr. Feinstein's market index, peer index, benchmark bond index, and indicator variables for each of the news days. News days are the effective dates listed in Feinstein Report, Exhibit-6. In addition, January 28, 2014 is also included as a news date, corresponding to Moody's revised credit rating outlook for ARCP.

[2] The regressions include only trading days with a one-day price return (i.e., there is trading and price information both on the current trading day and one trading day prior).

[3] Number of days where at least one note has daily return information for the statistical significance calculation.

[4] Includes the Convertible Notes and the 144 Notes.

[5] October 29, 2014 is excluded from this table.